



Design & Access Statement

E04759

APPENDIX E

External Lighting

HCC Property Services

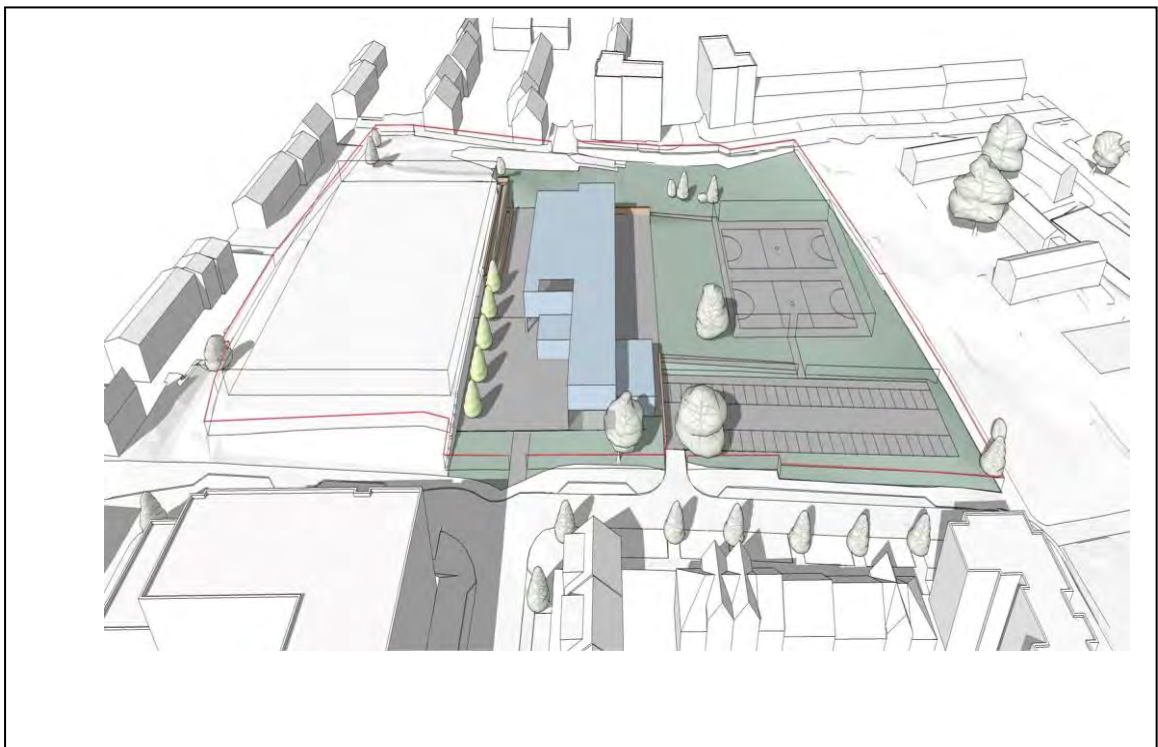
Electrical Engineering Services

Information for Planning – External Lighting Strategy

E04759 Ranikhet Academy School

March 2021

Issue no. Planning



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Date:	March 2021
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Revision History			
Issue number	Description	Author(s)	Date
1	Initial issue	MS	Mar 2021

1 Executive Summary

The following information outlines the strategy at Planning stage for the proposed external lighting at Ranikhet Primary Academy, Reading. An appropriate lighting strategy for the site has been developed and assessment made of effects on the surrounding environment and neighbouring properties.

The lighting scheme in this report is to be viewed as a lighting design strategy rather than a detailed design solution. It is recommended that the lighting strategy outlined in this report is adopted including criteria, luminaries, switching methods, lamp types etc. and developed into a more detailed design when undertaking the full external lighting design of the site.

An adequate and safe level of lighting will be provided for site tasks, school and community activities, amenity and security, whilst maintaining a minimal impact on the site surroundings, environment and neighbouring properties.

This lighting strategy considers building-mounted external lighting, pathway lighting, car park lighting and lighting to the new MUGA.

These proposals have been prepared with due note of the recommendations made within ILP Guidance Note 01: 2020 – Guidance notes for the reduction of obtrusive light.

2 Introduction

2.1 Scope of External Lighting Report

This report outlines the external lighting strategy for the new school, and considers the potential effects of the proposed development's lighting installation upon the surrounding areas. The report accompanies the planning application for the proposed new Ranikhet Academy Primary School.

2.2 Site Location & Description

The site is located in Spey Road, within the Tilehurst district of Reading Borough Council.

For the purpose of this report it has been assumed that the site falls into Lighting Class Environmental Zone E3 - Suburban, as the Ranikhet site lies within a suburban residential development outside the city centre of Reading.

2.3 Objectives

The general objective of this report is to provide details of the proposed external lighting and assess the likely impact of the lighting scheme for the proposed Ranikhet Primary Academy on the surrounding area and environment.

Specific objectives of the proposed lighting scheme when fully designed include:

- To limit light pollution and sky glow
- To limit obtrusive light, spill light / trespass light and glare to neighbouring land and properties
- To provide an external lighting strategy and level of illuminance that addresses site security and complies with the police initiative 'Secured by Design' approach
- To provide a safe and adequate level of illuminance for the proposed exterior areas, consisting of entrances/ exits, access routes for cars and lorries, pedestrian and cycle paths, loading bays and lay down areas, car parks and cycle parks, and to allow the site to receive deliveries notionally Mon-Fri 0700-1700, to be confirmed and agreed with the school
- To provide a safe level of illuminance for movement of vehicles, goods and persons

3 Assessment methodology

An appropriate initial lighting scheme for the site has been assessed using Relux standard industry software. Any stated lighting outputs have been calculated with all the luminaires switched on. However, this level of illuminance will only be during evening periods after normal school operating hours when the MUGA is in community use. Outside these times a part lighting strategy will be used throughout the site, as outlined in the report, to further reduce light levels during the evening periods.

From these initial calculations, lighting plots illustrating the illuminance levels throughout the site and at the boundary have been produced so that the lighting scheme's impact can be assessed. Refer to accompanying lighting information for details.

4 The Proposed Lighting Scheme

The lighting scheme detailed in this report should be viewed as a lighting design strategy rather than a detailed design solution.

4.1 Recommended lighting level values

Lighting levels have been designed in accordance with SLL Code for Lighting and ILP Guidance Note 01-2020 – Guidance note for the reduction of obtrusive light.

Using guidance from the SLL Lighting Code, the following design criteria have been used:

- Pedestrian pathways also possibly used by bicycles and occasionally for slowly moving vehicles (max 10 km/h) e.g. bicycles, trucks and excavators is 10 Lux Maintained Average (horizontal)
- School car park is 20 Lux Maintained Average (horizontal) with uniformity of 0.25
- MUGA is 200 Lux Maintained Average (horizontal) with uniformity of 0.6

4.2 Strategy for Minimising Obtrusive Light and Visual Impact of lighting Scheme

Careful consideration has been given to reducing obtrusive light during the night and the visual impact of the lighting scheme during the day, whilst maintaining an adequate level of illuminance for its application on the site. Particular attention has been paid to minimising the presence of the scheme and any intrusion, glare or sky glow produced by the scheme.

For the car park, MUGA and existing lighting to the existing STP the luminaires are to be column mounted. Car park lighting columns will be 5m high. MUGA will be lit by 4 No. 10m high raise/lower columns.

The column mounted luminaires have been chosen to be as inconspicuous as possible. The luminaire, arm bracket and column shall generally be galvanized steel or grey coloured. The arm brackets will be kept as short as possible with 0 degrees uplift. The luminaires for the car park, pathways and mounted on the building will have 0% upward light ratio. They are also fitted with flat glass to reduce the visibility of the light source.

Wherever possible luminaires are to be orientated towards the site, away from the land outside the site to make them less intrusive. Luminaires have been chosen that have good light control and cut off angles to reduce light spillage. All the luminaires are directed at the ground to minimise glare.

Building mounted luminaires have been proposed to illuminate final exits and pathways around the building. Again these have a flat glass to reduce visibility of the light source, and have 0% upward light component.

Consideration has been given to reducing the extent of illuminance falling on the building façade to reduce the visual impact of the buildings from a distance, whilst maintaining safe light levels for pedestrian circulation during the hours of darkness, and for security.

4.3 Strategy for Luminaire Types

The site shall be lit using LED luminaries throughout. These will be column-mounted in the car park, along pathways and for the MUGA. Building mounted LED luminaires will be utilised around the building for amenity and security purposes.

LED luminaires shall be utilised throughout, this will provide good colour rendering to improve visibility and provide a safer environment in line with a 'secured by design' approach. Using this type of luminaire will provide an energy efficient solution and they are also Building Regulations Part L and BREEAM compliant. These luminaries, or equal and approved, have been chosen as they have been designed to be anti-light pollution and low glare with good levels of efficiency for the chosen luminaire types and low upward light ratio.

All the luminaries are IP66 rated and impact resistant. For specific details, refer to supplementary information that accompanies this report.

4.4 Lighting Strategy and Luminaire Controls

Lighting controls will be utilised to ensure that impact on surrounding areas is minimised.

The MUGA lighting will be timeclock controlled with individual switches for each lighting column. These will be located in a control cubicle adjacent to the MUGA, with consideration given to a duplicate set of switch controls located within the building. Time periods will be set to facilitate community use for the required days/times.

Car park lighting and pathway lighting to STP will have photocell and timeclock control, with lights coming on at dusk and going off when the school is unoccupied, typically 18.30hrs, to be confirmed with school. Override facility will be installed should car park lighting outside normal time periods be required.

Building mounted lighting for amenity and security will have timeclock and photocell control, with lights coming on at dusk for amenity and security use, and going off at a pre-determined time, 23:00hrs latest but to be agreed with school.

Photocells are to be used as a primary control on all amenity and car park lighting so that no luminaries will be left on during daylight hours. In addition, several programmable 7-day time clocks will be wired into the control system so that the amenity lighting circuits can be programmed to turn on/off as and when they are needed to suit school activities, kitchen delivery times and working times of the school staff.

4.5 Lighting for MUGA

Column-mounted LED sports floodlight luminaires are proposed, located at corners of MUGA Area. 4 No. columns will be raise/lower fold-down type 10m in height. Luminaires will incorporate 8 No. LED luminaires per column, total 1200W as per Abacus AAA-Lux AL90 1200W LED flood HT GEN7. Each luminaire will be complete with light shield to comply with CIE150 Obtrusive Light Directive.

4.6 Lighting for Car park

Column-mounted, dark sky compliant luminaires, utilising 40W LED luminaires as per Abacus AL 61003/40W/4K with 1m horizontal outreach bracket have been selected for use in the school car park. These would be mounted on heavy duty 5m columns with arm brackets so that they are high enough that they cannot be easily tampered with, but are as low as practical to limit their visibility from a distance and overall visual and environmental impact. These luminaires have controlled directional light with zero upward light output to reduce light pollution, light spill and discomfort glare. They will be fitted with flat glass so that the illuminated part of the lantern is less visible. The luminaires have been positioned to keep light spill beyond the site boundary to a minimum.

4.7 Lighting for Pedestrian Walkways

Pedestrian access pathways to the west of the site will be lit by LED luminaires mounted on 4m high columns, as ASD Highway Diamond Elite 8 or 12 LED luminaires, ref. HWD2/B4LED835-M1 or HWD/B4LED1235M-S4, depending on location. Again, these would be mounted so they are high enough that they cannot easily be tampered with but as low as practical to limit their visibility from a distance and their overall visual and environmental impact. These luminaires have controlled directional light with zero upward light output to reduce light pollution, light spill and discomfort glare. They will be fitted with flat glass so that the illuminated part of the lantern is less visible, and rear light shields. Again, the luminaires have been positioned to keep light spill beyond the site boundary to a minimum.

On the pedestrian approach to the South of the site, building mounted lighting would be supplemented by 3 No. Thorn Alumet Control Direct LED architectural lighting columns. These luminaires also have controlled directional light with zero upward light output to reduce light pollution, light spill and discomfort glare. These lighting columns have been positioned to keep light spill beyond the site boundary to a minimum.

4.8 Building mounted luminaires

Building-mounted luminaires are proposed for amenity and security outside the building. Proposed luminaires are CLS Double Light 140 downlight, wall mounted, 12.1W LED, typically mounted at a height of 2.5m above ground level. These luminaires have a 0% upward light component. They are to be fixed to the building façade in the positions shown on the drawing

accompanying this report. Luminaires will be controlled via photocell and timeclock to come on at dusk and go off at predetermined time at night.

5 Assessment of the impact of the overall lighting scheme

Drawing E4759-HCC-E-8100 EXTERNAL, and the accompanying manufacturer's calculations and data sheets, shows the lighting scheme for the site, with the illuminance levels shown throughout the site and at the boundaries. The calculation model was prepared using industry standard software, Relux. It shows that adequate levels of lighting have been achieved on the site with minimal effect on the surrounding area. 5 Lux is the maximum value of illuminance that would be measured at the site boundary, once the proposed site planting / hedgerows are in place.

6 Conclusions

By adopting the lighting strategy including criteria, luminaires, control and switching methods etc. outlined in this report it can be concluded that:

- Lighting levels at the site boundary will not exceed 5 Lux
- Lighting as proposed would not cause excessive glare to neighbouring domestic properties from this site
- The majority of the luminaires will not be directly visible to neighbouring domestic properties
- The effect on the night sky should be minimal inside the site and zero outside the site
- The lighting scheme will be energy efficient utilising luminaires with high efficiency LED light sources, combined with efficient lighting controls
- An adequate and safe level of lighting can be provided for site tasks, amenity and security, whilst maintaining a minimal impact on the site surroundings, environment and neighbouring properties.

AL61000 Series

IP66

IK09

Abacus[®]
Leaders in Lighting



Benefits

- Tool-less quick access latch
- Screw-less maintenance
- Durable die-cast aluminium housing
- Flexibility with vertical or horizontal spigot mounting
- Multiple optics

Key technical features

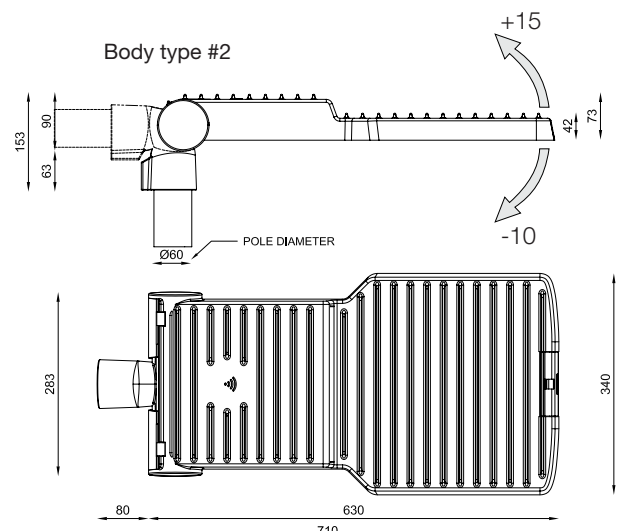
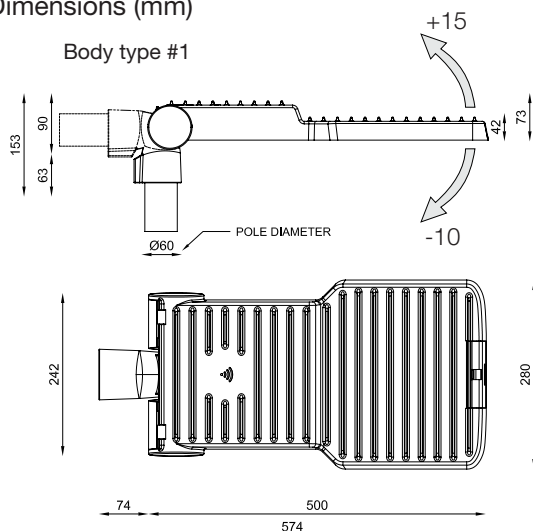
- Controls; Dali, 1-10V, RF or PLC (specify at enquiry)
- Efficacy up to 130 lm/W
- Integrated 5 level dimming module (optional)
- Overheat protection
- Constant light output (optional)
- Time-dependant lumious flux control
- Power reduction; flexible lumious flux
- IP66 and IK09 rated
- Colour temperature 4000K as standard (options available)
- CRI ≥70 (80 optional)
- Power supply 100Vac - 277Vac
- Standard surge protection 6kV

Applications

- Road
- Rail
- Open area
- Amenity

Colour: Grey

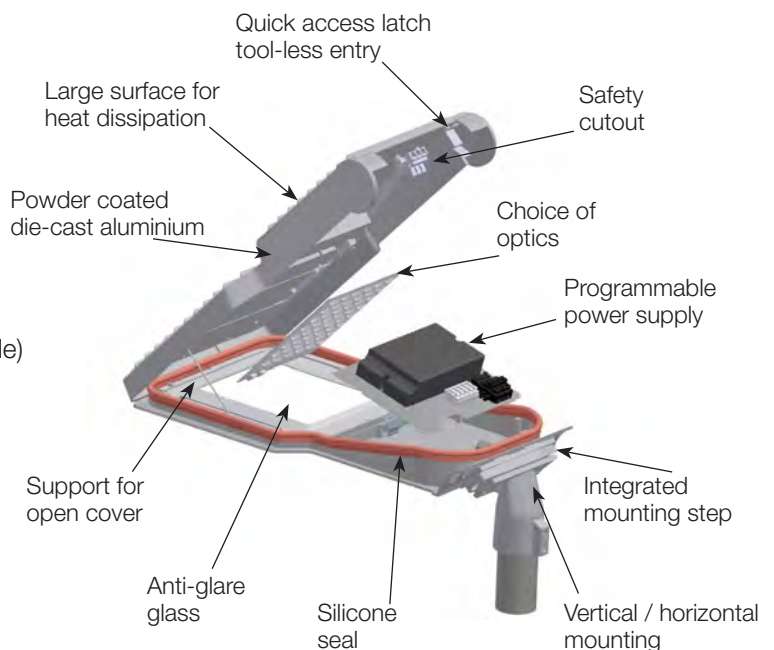
Dimensions (mm)



An innovative road lighting luminaire of modular construction designed with ease of maintenance in mind. Tool-less upgrades of key components such as power supply and light engine along with field-replaceable LED modules ensure the luminaire takes full advantage of future improvements in LED technology.

Constructed from high pressure die-cast aluminium, the AL61000 series is available in two body sizes and offers six standard lumen packages, from 1200 to 15,600 lumens, and comes with six different optics.

With a lifetime of 100,000 hours (L80B10) combined with an efficacy of more than 130 lm/W, the AL61000 series keeps both operating and maintenance costs to an absolute minimum.



AL61000 Series

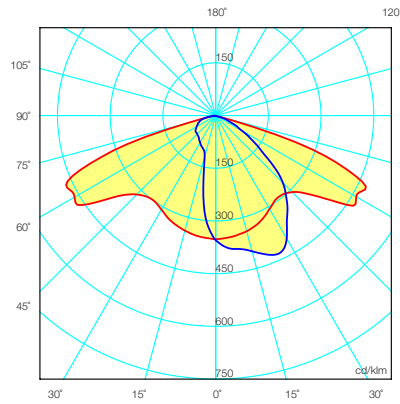
IP66

IK09

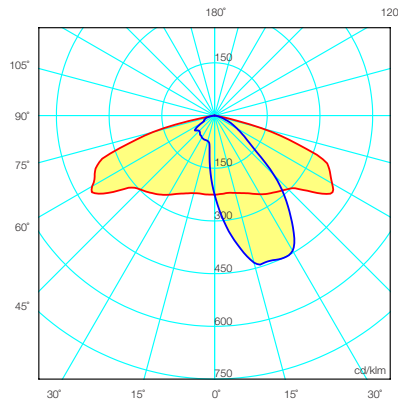
Abacus®

Leaders in Lighting

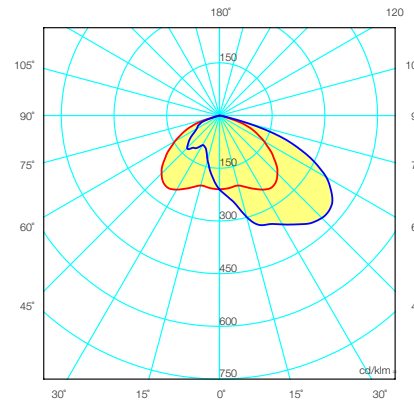
Optics



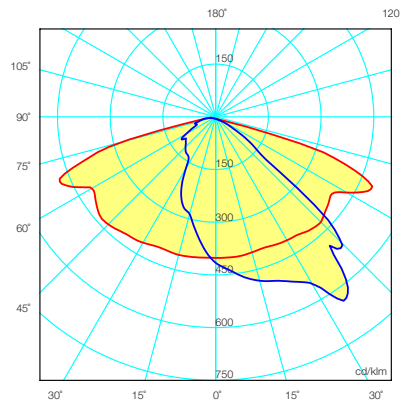
(010) Suitable for larger distance between poles and high mounting installations. Higher uniformity factor



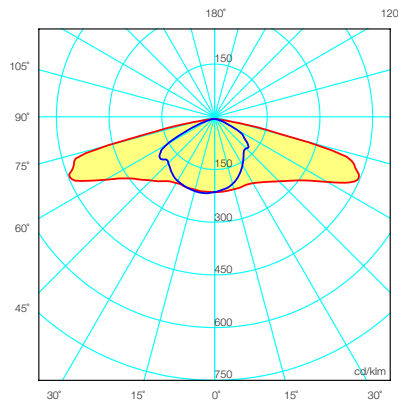
(002) Suitable for narrower roadways across roads, cycling and pedestrian areas



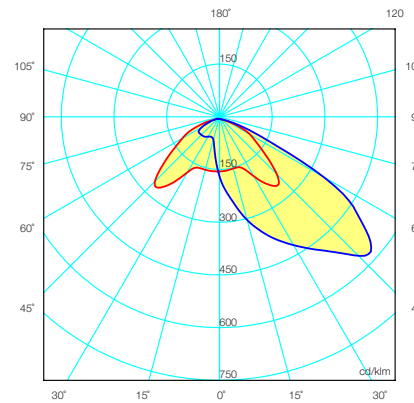
(110) Suitable for wide roadways, parking spaces. Smaller distance between columns



(020) Suitable for wide roadways, larger distance between columns



(200) Suitable for larger distance between columns, within bicycle paths



(202) Suitable for wide roadways and parking spaces with smaller distances between columns

Technical Specification	Body type 1	Body type 2
Lifetime L80B10	> 100,000 hours	
Supply voltage	100Vac - 277Vac	
LED	4-8	12-24
Power (W)	10, 25, 40	60, 80, 120
Light flux (lm)	1,200 - 5,100	7,530 - 15,540
Power factor	> 0.96	
CCT	4,000 K (other CCT available)	
Factor of colour rendering CRI	≥ 70 (80 optional)	
Mechanical strength	IK09	
Protection class	IP66	
Additional surge protection	6kV standard (10kV or 20kV option)	
Operating temperature	-40°C to +55°C	
Electrical class	Class I (Class II optional)	
Weight	6kg	9kg
EPA rating	0.0336m²	0.0406m²
Dimensions (mm)	574 x 242 x 153	703 x 285 x 153
Mounting	60mm pole (adaptor required for other columns dimensions)	
Tilt	-10° to +15° (horizontal and vertical installation)	
Certificates	IEC 60598-1:2014 (8 edition); IEC 60598-2-3:2002 + A1:2011; EN 60598-1:2015; EN 60598-2-3:2003 + A1:2011; IEC/EN 62031:2008 + A1+A2; IEC/TR 62778:2014; EN60068-2-6: N60068-2-27: CE, ENEC	
Guarantee	5 years on electronics, 10 years on mechanics, upon request	
Remote control	Optional RF or PLC	

AL61000 Series
IP66
IK09

Luminaire code	LED type	Luminaire Wattage	Luminaire - Lumen output (lm)	Driver current (mA)	Number of LEDs	Body type	Light distribution type	Weight (kg)	Wind area (m ²)
AL61001	Standard	10	1200	700	4	1	(010) Suitable for larger distance between poles and high mounting installations. Higher uniformity factor	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406
AL61002	Standard	10	1200	700	4	1	(002) Suitable for narrower roadways across roads, cycling and pedestrian areas	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406
AL61003	Standard	10	1200	700	4	1	(110) Suitable for wide roadways and parking spaces. Smaller distance between columns	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406
AL61004	Standard	10	1200	700	4	1	(020) Suitable for wide roadways, larger distance between columns	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406
AL61005	Standard	10	1200	700	4	1	(200) Suitable for larger distance between columns, within bicycle paths	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406
AL61006	Standard	10	1200	700	4	1	(202) Suitable for wide roadways and parking spaces with smaller distances between columns	6	0.0336
		25	3270	700	6	1		6	0.0336
		40	5100	700	8	1		6	0.0336
		60	7530	700	12	2		9	0.0406
		80	10200	700	16	2		9	0.0406
		120	15540	700	24	2		9	0.0406



**HIGHWAY
DIAMOND
ELITE**

ASD
STREET LIGHTING
A DIVISION OF ASD LIGHTING PLC

Datasheet



- ◇ UK Manufactured
- ◇ High Specification
- ◇ High Efficacy
- ◇ Tool Free Maintenance
- ◇ IP66 / IK10
- ◇ CE
- ◇ ENEC
- ◇ 10 Day Delivery

The Highway Diamond Elite by ASD Lighting offers a complete family of luminaires with an unsurpassed flexibility of lumen outputs, optical distributions and specification features.

It is suitable for use in a multitude of locations, from rural villages through to modern 24 hour smart cities, main roads, motorways and infrastructure projects.

Four body sizes with modern sympathetic styling to ensure architects, planners and designers can follow an integrated design with a homogenous family of luminaires.

ASD Lighting PLC
Mangham Road, Barbot Hall Industrial
Estate, Rotherham, S61 4RJ, UK

T: 07920 336327
E: nfrench@asdlighting.com
W: asdstreetlighting.com

Luminaire
Manufacturer
of the Year



Highway Diamond™ Elite Range



Technical Data	Standard Features	Additional Detail
LED	✓	Designed solely for an LED light source
Driver	✓	DALI Programmable, CMS Compatible
Driver Current	Various	200 - 700 mA
Dimming	✓	Multiple Step / Part Night
Constant Light Output	✓	
Photometric Lens Options	✓ (Multiple)	Inc. Narrow / Medium / Wide / Extra Wide / Pedestrian Crossing
Luminaire Materials	LM6 Marine Grade Die-Cast Aluminium	Housing / Spigot / Fixing Clip
RAL Colours	Black / Light Grey	RAL 9005 / 9006
Correlated Colour Temperature	Various	Warm White / Neutral White / Cool White
Colour Rendering	> 80 > 72	Warm White Neutral White / Cool White
Ingress Protection Rating	IP66	Gear & LED Compartments
Impact Protection Rating	IK10	Optical Cover
Optical Cover	✓ Flat Cover	UV Stable Polycarbonate
Entry to Gear Compartment	Tool Free	Simple fixing clip
Driver Gear Tray Replacement	Tool Free (Excluding Micro Highway Diamond)	Completely replaceable without tools required
Inbuilt Anti-Tamper Facility	✓	Instructions provided in the luminaire
Protection Class	Class 1	
Warranty Period	Standard 5 Years	Extended Warranties Available
Specification	✓ (Various)	Inc. CE Certification / ENEC Mark
Design Life	100,000 hr	> L90, < F10
Mains Voltage	220-240 V / 50-60 Hz	
Operating Temperature Range	-40 to +55°C	Based on ambient external temperature
Surge Protection	Inbuilt Driver	10 kV (1 pulse) / 8 kV
Vibration Tested	✓	Certificates - EN 60068-2-6 & EN 60068-2-64
Manufacturing Location	UK	



Footpath



Residential



Cycle Routes



Car Parks



Traffic Routes



Pedestrian



Rail



Infrastructure



Motorway



HIGHWAY
DIAMOND
ELITE

Micro Highway Diamond™ Elite Range



The Micro Highway Diamond is the smallest luminaire in the family. It is a high specification, high efficacy, UK manufactured luminaire delivering up to 4,000 lumens. Detailed below are some of the options and further features the Micro Highway Diamond has to offer.

All features previously listed in the Highway Diamond Elite Range (page 2) apply to this product.

Technical Data	Features	Additional Detail	Extras
LED Configuration	4 / 8 / 12 / 16		
System power watts	4 – 37 W		
Delivered lumens	300 - 4000 lm		
Weight (Excluding Spigot)	3.1kg		
Weight (Including Spigot)	3.5kg		
Windage	< 0.02m²		
Mounting & Tilt Options	Post top Post top tilt Side entry Side entry tilt Side entry Side entry tilt	Ø 60 mm – Ø 76 mm 0° / 5° / 10° / 15° / 20° Ø 60 mm – Ø 76 mm -5° / 0° / 5° / 10° / 15° Ø 28 mm – Ø 42 mm -10° / -5° / 0° / 5° / 10°	

Options			
Luminaire Colour	Any RAL colour available. Including but not limited to: RAL5015 RAL6003 RAL6005 RAL6013 BS480000A01	Sky Blue Olive Green Moss Green Reed Green Oyster Grey	1 2
Switching	NEMA Type Sockets, Mini Cell, CMS Compatible		2
Pre-Wired	✓	Lengths and cable specification as requested	2

1 Specify at time of order, may affect lead time. **2** Specify at time of order, may incur an additional charge.



4 LED



8 LED



12 LED

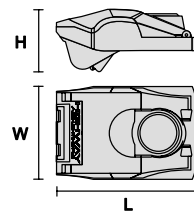


16 LED

Micro Highway Diamond™ Elite Range



Code	
HWD2/ HWD2P/ HWD2S/	60 - 76mm spigot 60 - 76mm (Set as post top pre-wired only) 28 - 42mm spigot
Colour Finish	
B J	Black (RAL 9005) Light Grey (RAL 9006)
Correlated Colour Temperature	
3 4 57	3000K 4000K 5700K
LED Quantity	
LED4 LED8 LED12 LED16	4 LED 8 LED 12 LED 16 LED
Drive Current (200 - 700mA)	
20 30 35 40 50 60 70	200mA 300mA 350mA 400mA 500mA 600mA 700mA
Switching (Only if requested)	
C NS 7NS	Mini Cell NEMA Socket 7 Pin NEMA Socket Other switching systems available on request. NFC driver available on request.
Optics	
-S4 As above Insert optic code required	S4 Optic S0 / S1 / S2 / S3 / S5 / S6 / S7 / S8 / M1 / M2 / M3 / M4 / M5 / M6 / M7 / M8 / F0 / F1 / F2 / F3 / F4 / A1 / A2 / A3 / A4 / A5
Pre-wired (Only if requested)	
W8 2W8	8 metre Pre-wired 3 core flex (1.5mm) 8 metre Pre-wired 3 core flex (2.5mm)



Size	
Length	255mm
Width	165mm
Height	111mm

Code Example

HWD2/B4LED835C-S1-W8

Micro Highway Diamond Elite™ 60-76mm spigot, Black Finish, 4000K, 8 LED, 350mA, Mini Cell, S1 Optic, 8m Pre-wired 1.5mm flex.

Highway Diamond™ Elite Range

The Highway Diamond is the original luminaire in the family. It is a high specification, high efficacy, UK manufactured luminaire delivering up to 11,000 lumens. Detailed below are some of the options and further features the Highway Diamond has to offer.



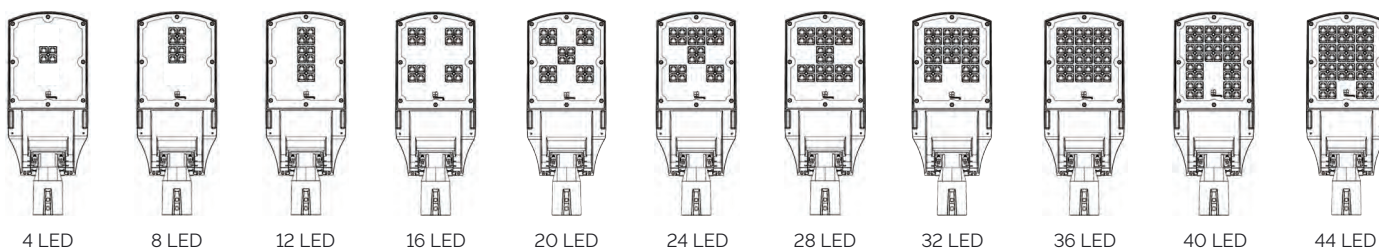
All features previously listed in the Highway Diamond Elite Range (page 2) apply to this product.

Technical Data	Features	Additional Detail	Extras
LED Configuration	4 / 8 / 12 / 16 / 20 / 24 / 28 / 32 / 36 / 40 / 44		
System power watts	4 – 95 W		
Delivered lumens	300 – 11044 lm		
Weight (Excluding Spigot)	4.27kg 4.47kg	4 – 16 LED 16 – 44 LED	
Weight (Including Spigot)	4.57kg 4.97kg	4 – 16 LED 16 – 44 LED	
Windage	< 0.04m ²		
Mounting & Tilt Options	Post top Post top tilt Side entry Side entry tilt Side entry Side entry tilt	Ø 60 mm – Ø 76 mm 0° / 5° / 10° / 15° / 20° Ø 60 mm – Ø 76 mm -5° / 0° / 5° / 10° / 15° Ø 28 mm – Ø 42 mm -10° / -5° / 0° / 5° / 10°	

Options			
Luminaire Colour	Any RAL colour available. Including but not limited to: RAL5015 RAL6003 RAL6005 RAL6013 BS48000A01	Sky Blue Olive Green Moss Green Reed Green Oyster Grey	1 2
Switching	NEMA Type Sockets, Mini Cell, CMS Compatible		2
Pre-Wired	✓	Lengths and cable specification as requested	2

Optional Features			
Auto Disconnect	✓	Switches unit off upon opening	2
PIR	✓		1 2

1 Specify at time of order, may affect lead time. **2** Specify at time of order, may incur an additional charge.



4 LED

8 LED

12 LED

16 LED

20 LED

24 LED

28 LED

32 LED

36 LED

40 LED

44 LED

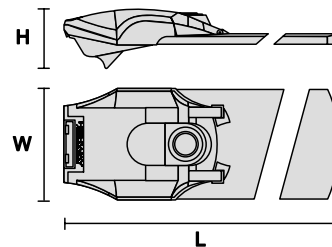


HIGHWAY
DIAMOND
ELITE

Highway Diamond™ Elite Range



Code	
HWD/ HWDP/ HWDS/	60 - 76mm spigot 60 - 76mm (Set as post top pre-wired only) 28 - 42mm spigot
Colour Finish	
B J	Black (RAL 9005) Light Grey (RAL 9006)
Correlated Colour Temperature	
3 4 57	3000K 4000K 5700K
LED Quantity	
LED4 LED8 LED12 LED16 LED20 LED24 LED28 LED32 LED36 LED40 LED44	4 LED 8 LED 12 LED 16 LED 20 LED 24 LED 28 LED 32 LED 36 LED 40 LED 44 LED
Drive Current (200 - 700mA)	
20 30 35 40 50 60 70	200mA 300mA 350mA 400mA 500mA 600mA 700mA
Switching (Only if requested)	
C NS 7NS	Mini Cell NEMA Socket 7 Pin NEMA Socket Other switching systems available on request. NFC driver available on request.
Optics	
-S4 As above Insert optic code required	S4 Optic S0 / S1 / S2 / S3 / S5 / S6 / S7 / S8 / M1 / M2 / M3 / M4 / M5 / M6 / M7 / M8 / F0 / F1 / F2 / F3 / F4 / A1 / A2 / A3 / A4 / A5
Pre-wired (Only if requested)	
W8 2W8	8 metre Pre-wired 3 core flex (1.5mm) 8 metre Pre-wired 3 core flex (2.5mm)



Size

Length	476mm
Width	233mm
Height	116mm

Code Example

HWD/B4LED835C-S1-W8

Highway Diamond Elite™ 60-76mm spigot,
Black Finish, 4000K, 8 LED, 350mA, Mini
Cell, S1 Optic, 8m Pre-wired 1.5mm flex.

Midi Highway Diamond™ Elite Range



The Midi Highway Diamond is a new edition to the Highway Diamond Elite range with enhanced high specification features. It is a high efficacy, UK manufactured luminaire delivering up to 25,000 lumens. Detailed below are some of the options and further features the Midi Highway Diamond has to offer.

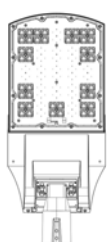
All features previously listed in the Highway Diamond Elite Range (page 2) apply to this product.

Technical Data	Features	Additional Detail	Extras
LED Configuration	44 / 52 / 60 / 68 / 76 / 84 / 92 / 100		
System power watts	48 – 211 W		
Delivered lumens	4,832 - 24,341 lm		
Weight (Excluding Spigot)	< 11.5kg	44 – 100 LED (Weight varies dependent on driver configuration)	
Weight (Including Spigot)	< 12.5kg	44 – 100 LED (Weight varies dependent on driver configuration)	
Windage	< 0.11m ²		
Mounting & Tilt Options	Post top Post top tilt Side entry Side entry tilt	Ø 60 mm – Ø 76 mm -5° / 0° / 5° / 10° / 15° Ø 60 mm – Ø 76 mm -10° / -5° / 0° / 5° / 10° / 15° Insert reducers available for smaller diameters	
Auto Disconnect	✓	Switches unit off upon opening	

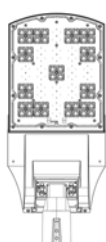
Options			
Luminaire Colour	Any RAL colour available. Including but not limited to: RAL5015 RAL6003 RAL6005 RAL6013 BS480000A01	Sky Blue Olive Green Moss Green Reed Green Oyster Grey	1 2
Switching	NEMA Type Sockets, Mini Cell, CMS Compatible		2
Pre-Wired	✓	Lengths and cable specification as requested	2

Optional Features			
PIR	✓		1 2

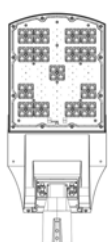
1 Specify at time of order, may affect lead time. **2** Specify at time of order, may incur an additional charge.



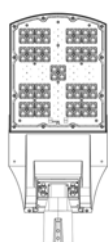
44 LED



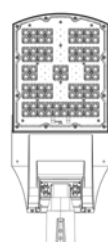
52 LED



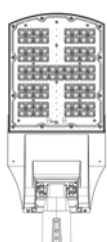
60 LED



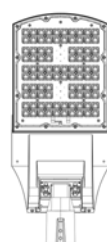
68 LED



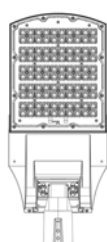
76 LED



84 LED



92 LED



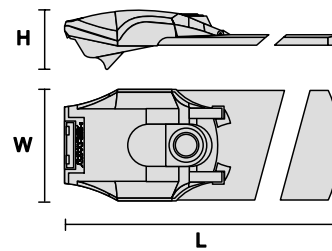
100 LED



Midi Highway Diamond™ Elite Range



Code	
HWD6/ HWD6/	60 - 76mm spigot 60 - 76mm (Set as post top pre-wired only)
Colour Finish	
B J	Black (RAL 9005) Light Grey (RAL 9006)
Correlated Colour Temperature	
3K 4K 57K	3000K 4000K 5700K
LED Quantity	
44 52 60 68 76 84 92 100	44 LED 52 LED 60 LED 68 LED 76 LED 84 LED 92 LED 100 LED
Drive Current (200 - 700mA)	
20 30 35 40 50 60 70	200mA 300mA 350mA 400mA 500mA 600mA 700mA
Switching (Only if requested)	
C NS 7NS	Mini Cell NEMA Socket 7 Pin NEMA Socket Other switching systems available on request. NFC driver available on request.
Optics	
-S4 As above Insert optic code required	S4 Optic S0 / S1 / S2 / S3 / S5 / S6 / S7 / S8 / M1 / M2 / M3 / M4 / M5 / M6 / M7 / M8 / F0 / F1 / F2 / F3 / F4 / A1 / A2 / A3 / A4 / A5
Pre-wired (Only if requested)	
W10 2W10	10 metre Pre-wired 3 core flex (1.5mm) 10 metre Pre-wired 3 core flex (2.5mm)



Size

Length	672mm
Width	329mm
Height	173mm

Code Example

HWD6/B4K6850-M1-W10

Midi Highway Diamond Elite™ 60-76mm
Spigot, Black Finish, 4000K, 68 LED, 500mA,
M1 Optic, 10m Pre-wired 1.5mm flex.

Maxi Highway Diamond™ Elite Range



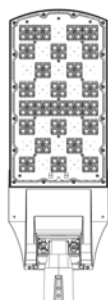
The Maxi Highway Diamond is the latest member of the Highway Diamond Elite family, with the same enhanced high specification features of the Maxi Highway Diamond. It is a high efficacy, UK manufactured luminaire delivering up to 40,000 lumens. Detailed below are some of the options and further features the Maxi Highway Diamond has to offer.

All features previously listed in the Highway Diamond Elite Range (page 2) apply to this product.

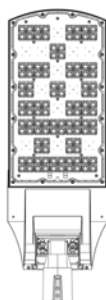
Technical Data	Features	Additional Detail	Extras
LED Configuration	100 / 112 / 124 / 136 / 148 / 160		
System power watts	106 – 338 W		
Delivered lumens	11,515 – 39,608 lm		
Weight (Excluding Spigot)	<14.5kg	100 – 160 LED (Weight varies dependent on driver configuration)	
Weight (Including Spigot)	<15.5kg	100 – 160 LED (Weight varies dependent on driver configuration)	
Windage	< 0.12m ²		
Mounting & Tilt Options	Post top Post top tilt Side entry Side entry tilt	Ø 60 mm – Ø 76 mm -5° / 0° / 5° / 10° / 15° Ø 60 mm – Ø 76 mm -10° / -5° / 0° / 5° / 10° / 15° Insert reducers available for smaller diameters	
Auto Disconnect	✓	Switches unit off upon opening	

Options			
Luminaire Colour	Any RAL colour available. Including but not limited to: RAL5015 RAL6003 RAL6005 RAL6013 BS480000A01	Sky Blue Olive Green Moss Green Reed Green Oyster Grey	1 2
Switching	NEMA Type Sockets, Mini Cell, CMS Compatible		2
Pre-Wired	✓	Lengths and cable specification as requested	2
Optional Features			
PIR	✓		1 2

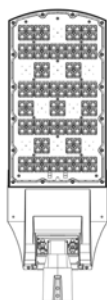
1 Specify at time of order, may affect lead time. **2** Specify at time of order, may incur an additional charge.



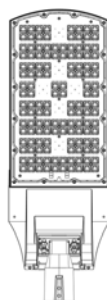
100 LED



112 LED



124 LED



136 LED



148 LED



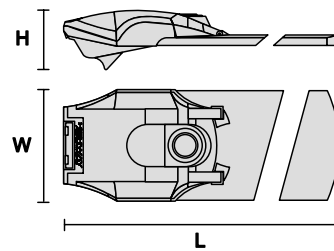
160 LED



Maxi Highway Diamond™ Elite Range



Code	
HWD8/ HWDP8/	60 - 76mm spigot 60 - 76mm (Set as post top pre-wired only)
Colour Finish	
B J	Black (RAL 9005) Light Grey (RAL 9006)
Correlated Colour Temperature	
3K 4K 57K	3000K 4000K 5700K
LED Quantity	
100 112 124 136 148 160	100 LED 112 LED 124 LED 136 LED 148 LED 160 LED
Drive Current (200 - 700mA)	
20 30 35 40 50 60 70	200mA 300mA 350mA 400mA 500mA 600mA 700mA
Switching (Only if requested)	
C NS 7NS	Mini Cell NEMA Socket 7 Pin NEMA Socket Other switching systems available on request. NFC driver available on request.
Optics	
-S4 As above Insert optic code required	S4 Optic S0 / S1 / S2 / S3 / S5 / S6 / S7 / S8 / M1 / M2 / M3 / M4 / M5 / M6 / M7 / M8 / F0 / F1 / F2 / F3 / F4 / A1 / A2 / A3 / A4 / A5
Pre-wired (Only if requested)	
W15 2W15	15 metre Pre-wired 3 core flex (1.5mm) 15 metre Pre-wired 3 core flex (2.5mm)



Size

Length	858mm
Width	329mm
Height	173mm

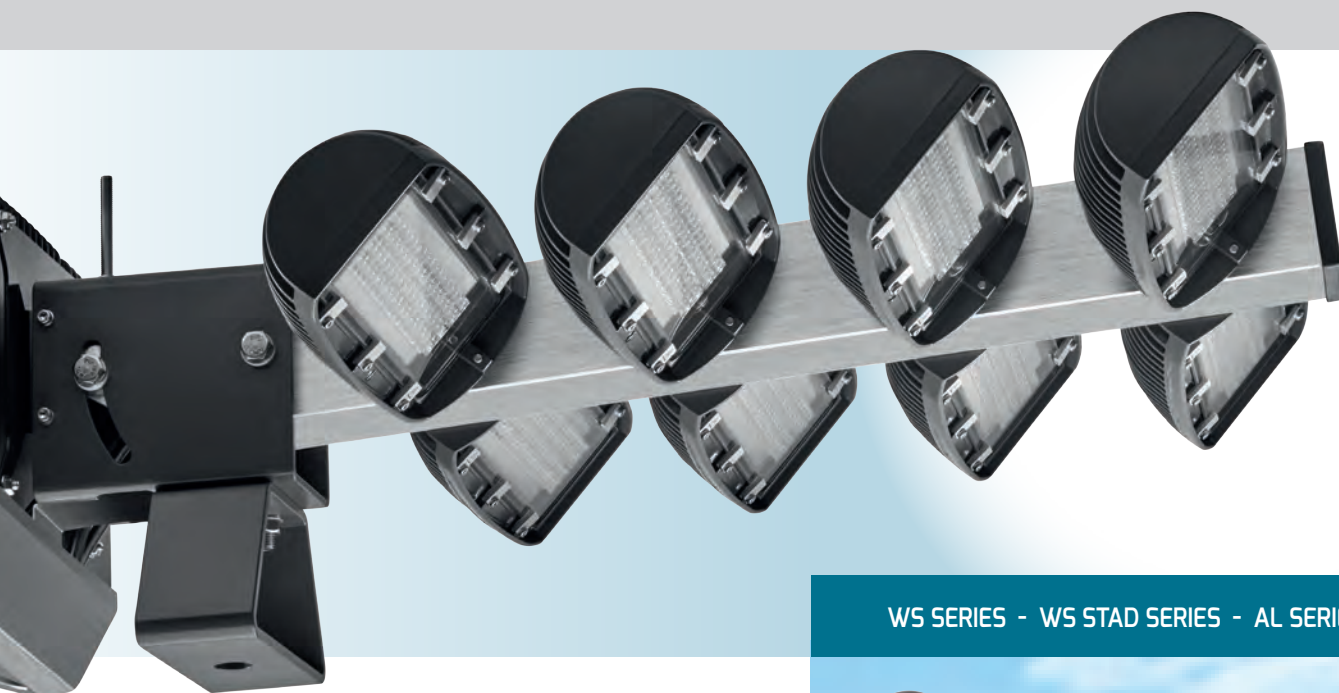
Code Example

HWD8/B4K16050-M1-W15

Maxi Highway Diamond Elite™ 60-76mm
Spigot, Black Finish, 4000K, 160 LED,
500mA, M1 Optic, 15m Pre-wired 1.5mm flex.

Gen7 luminaires

Increased light performance & integrated RS technology



Extremely powerful

AAA-LUX' Generation 7 combines an increased light output with the ability to reduce obtrusive light in the surrounding area.

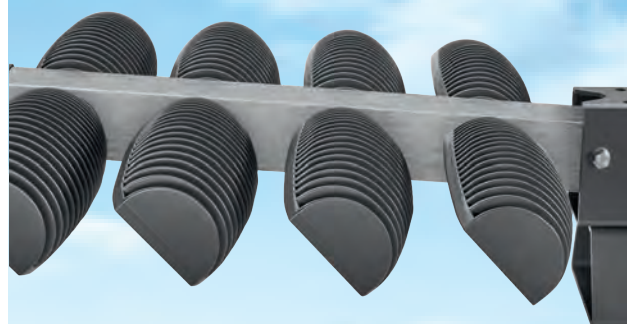
Less luminaires needed

The low amount of luminaires needed to meet lighting requirements, is truly a breakthrough in lighting technology. In some cases the amount of luminaires which are needed compared to the conventional equivalent, is as low as 80 – 90% while improving lighting quality at the same time.

Reduced Spill light

Thanks to the integrated RS technology the luminaire is prepared for optimum reduction of obtrusive light, by mounting light spill (LS) shields.

WS SERIES - WS STAD SERIES - AL SERIES



FEATURES



Less luminaires needed
Lowest total project cost
Re-use infrastructure



Wireless dimming
Remote monitoring
Smart City

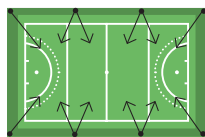
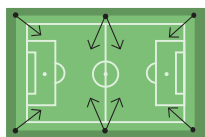


Ease of installation



Reduced Spill light
CIE150 compliant

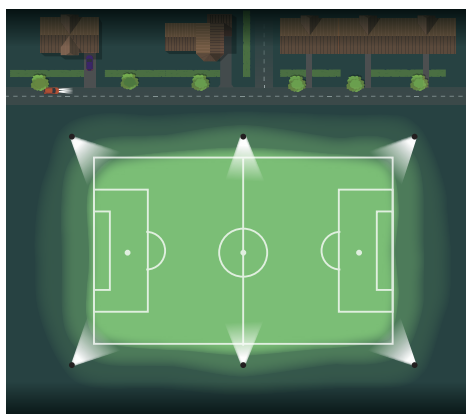
Savings Matrix



Generation 7 again reduced the number of luminaires needed, compared to the conventional 2.000w equivalent. Please ask for more Gen7 configurator overviews to compare specific sports accommodations. Standard light designs are available on request.

Reference sports	Football				Hockey
Light level	75lx	150lx	200lx	500lx	500lx
Conventional 2Kw	6	12	16	36	28
AAA-LUX Gen6 (2018)	6	10	14	34	24
AAA-LUX Gen7 (2020)	6	8	10/12	28	20

RS (Reduced Spill) Technology



Using RS technology, Gen7 luminaires are prepared for an optimum light spill control.

RS gives the best in class lighting on the field in combination with extreme low spill light for neighboring houses. To comply to the international CIE150 obtrusive light directive, additional light shields (LS) can be mounted. See detailed LS foto's below.

Sales Support Team can assist with making designs that avoid light spill in peoples houses.



More information available:

- Datasheets: WS series - WS STAD series - AL series
- Technical papers & Certificates
- Configurator Sheets for standard light plan options

Making sustainable high-power illumination accessible for all people



DOUBLE LIGHT 140 EDIS

COD: E5594-LBN-36

Use:
Outside, led

Installation:
Wall mounted

Body/structure:
EN AB-47100 Die-cast aluminium body

Coating:
Polyester powder coating with special treatment for outdoor use (sandblasting, pickling, n.3 washings, epoxy powder coating and surface finish in polyester powder).

Colour:
Black

Optic/reflector:
Polycarbonate metallized reflector

Equipment:
Silicon rubber gaskets

Glass/diffuser:
Clear serigraphed tempered glass

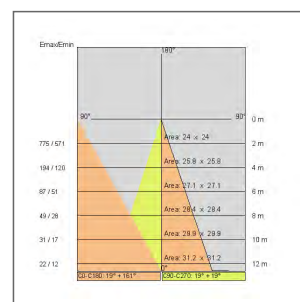
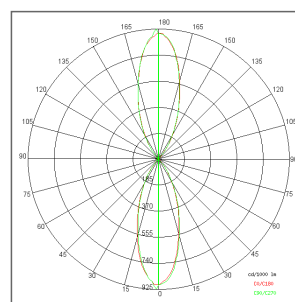
Gland:
Silicon rubber cable gland PG11

Control gear:
Integrated LED diodes ballast, stabilized output current 350mA dc

Voltage:	220-240V 50/60Hz
Beam:	Symmetric, double emission 36°
Insulation class:	Insulation class 1
Weight:	3,200 kg
IP rating:	65
Glow wire:	850 °C
Lamp included:	YES
LED Type:	COB LED
Luminaire wattage:	26.2 W
Luminaire luminous flux:	2360.3 lm
LED rated life:	50000 hours L80 B20
Colour temperature:	4000K
CRI:	80
Chromacy constancy:	3 SDCM

Notes:
Photometry refers to an optical assembly

Review board: 2019-01-18



LAMP: 2 x LED 12.1 W 1300 lm



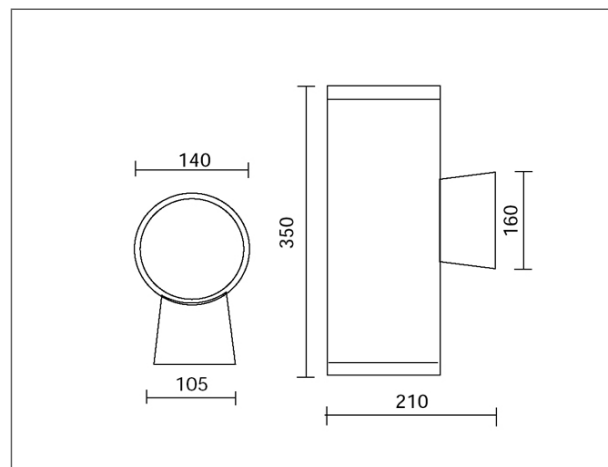
IK 7

IP 65

A+

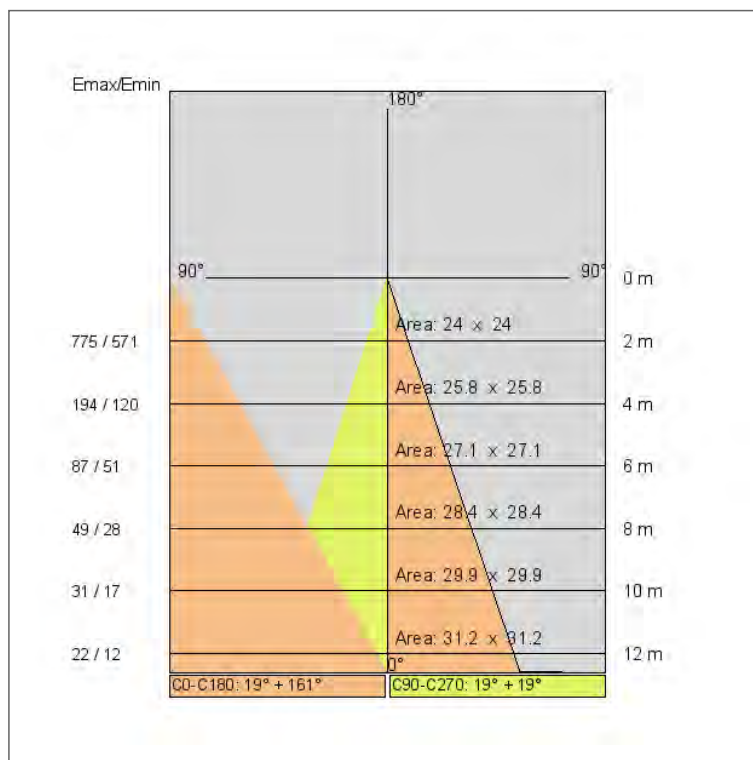
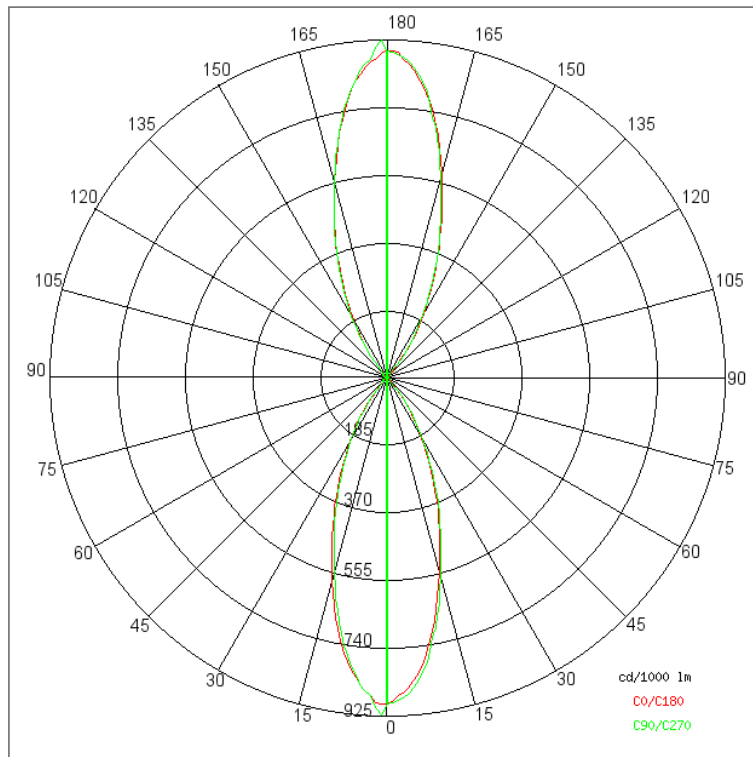


RG0

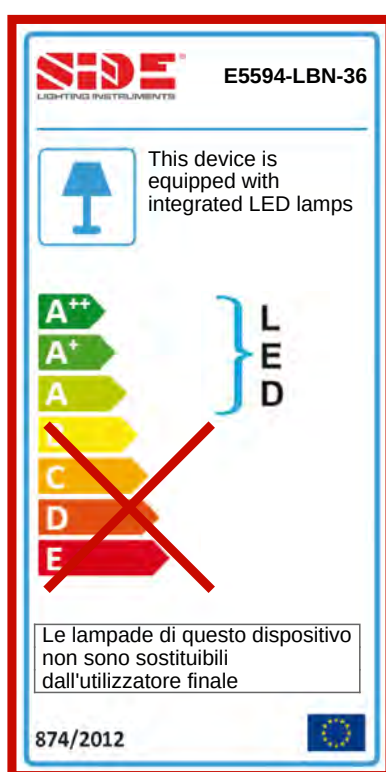


DOUBLE LIGHT 140 EDIS

COD: E5594-LBN-36



DOUBLE LIGHT 140 EDIS
COD: E5594-LBN-36



Alumet Control Direct LED

96274866 ALUMET CD 24L35-740 WSC-A CL LRT CL2 G4

LED 27W ALUL_24L35WSC4KCL	ISO 9223 C3	IP66	IK10		CE		T _a 25	
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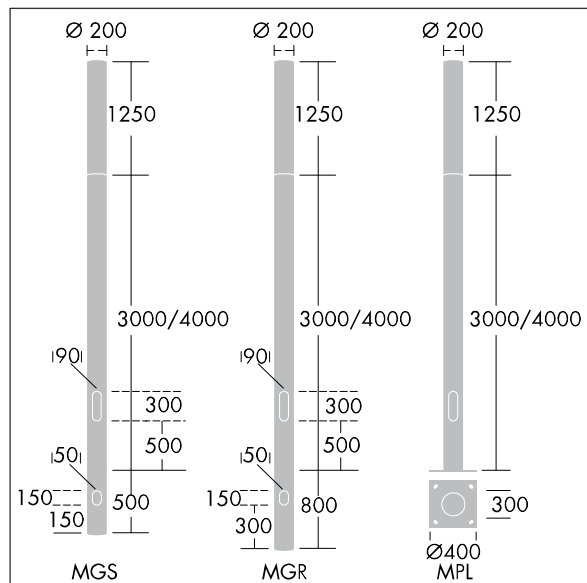
Alumet Control Direct LED

An architectural lighting column head with 24 LEDs driven at 350mA with a Wide Street & Comfort, asymmetric distribution and clear optic, configured for power reduction, controlled by an additional switched phase cable. ON = 100%, OFF = 50%, Top cap: die-cast aluminium. Diffuser: clear UV stabilised polycarbonate treated with anti graffiti varnish. Top cap and column: powder coated textured silver grey (close to RAL 9006), other RAL colours on request. Class II electrical, IK10, IP66. To be mounted on an Alumet column. Complete with 4000K LED

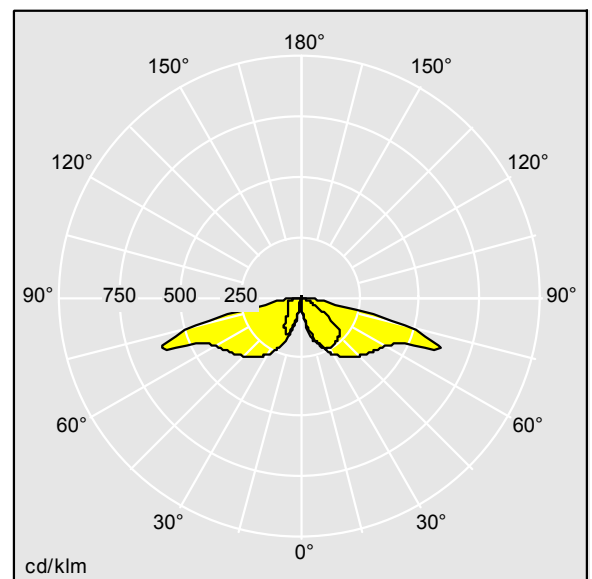
Dimensions: Ø200 x 1250 mm
Luminaire input power: 27 W
Luminaire luminous flux: 3055 lm
Luminaire efficacy: 113 lm/W
Weight: 9.8 kg
Scx: 0.079 m²



TLG_ALUM_F_DIR_LED24_LGY.jpg



TLG_ALUM_M_2LD1.wmf



TLLA_ALCD24L35WSC4KG33_DC.ltd

Lamp position: STD - standard
Light Source: LED
Luminaire luminous flux*: 3055 lm
Luminaire efficacy*: 113 lm/W
Lamp efficacy: 113 lm/W
Colour Rendering Index min.: 70
LOR: 1,00 ULOR: 0,00 DLOR: 1,00

Ballast: 1 x 96271178 DRV OS OT 60W 1.05A 115V
D #1A0 4DIMLT2
Correlated colour temperature: 4000 Kelvin
Chromaticity tolerance (initial MacAdam): 5
Rated useful life (B10)*:
L80 100000h at 25°C
Luminaire input power*: 27 W Power factor = 0.95
Dimming: SETLRT dimmable to 10%

All values marked with an * are rated values. Thorn uses tried and tested components from leading suppliers, however there may be isolated instances of technology-related failures of individual LEDs during the rated product lifetime. International standards set the tolerance in initial flux and connected load at $\pm 10\%$. Unless stated otherwise, the values apply to an ambient temperature of 25°C.

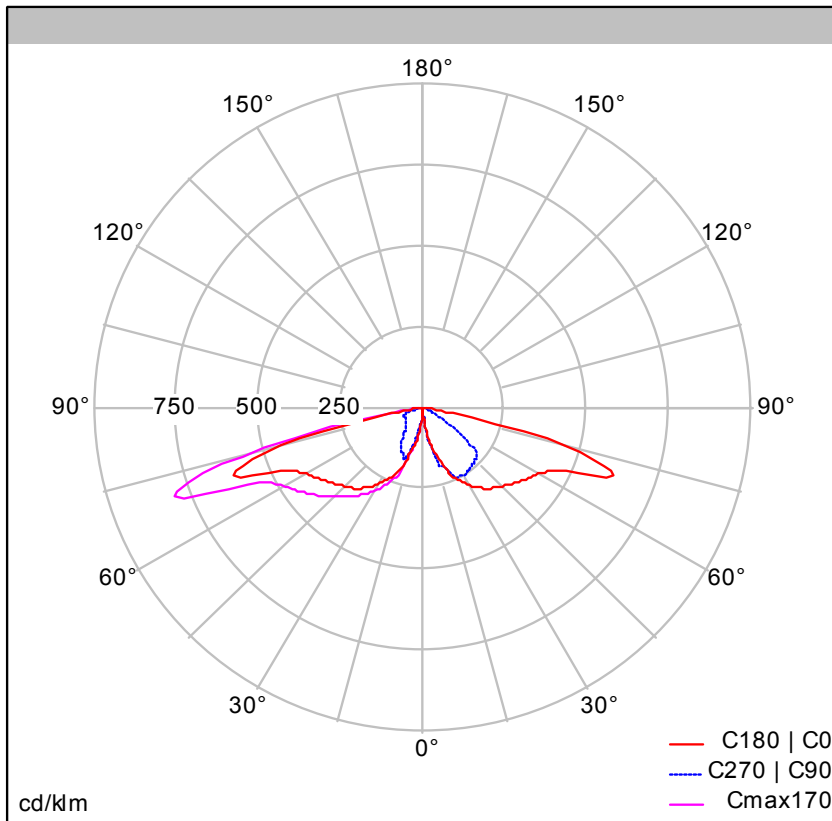
In most products the failure of one LED point causes no functional impairment to the lighting performance of the luminaire and is therefore no reason for complaint. Unless otherwise stated all Thorn LED products are suitable for unrestricted use (rated RG0 or RG1) with regard photobiological blue light safety (IEC/EN60598-1).

Thorn Lighting is constantly developing and improving its products. The right is reserved to change specifications without prior notification or public announcement.
© Thorn Lighting

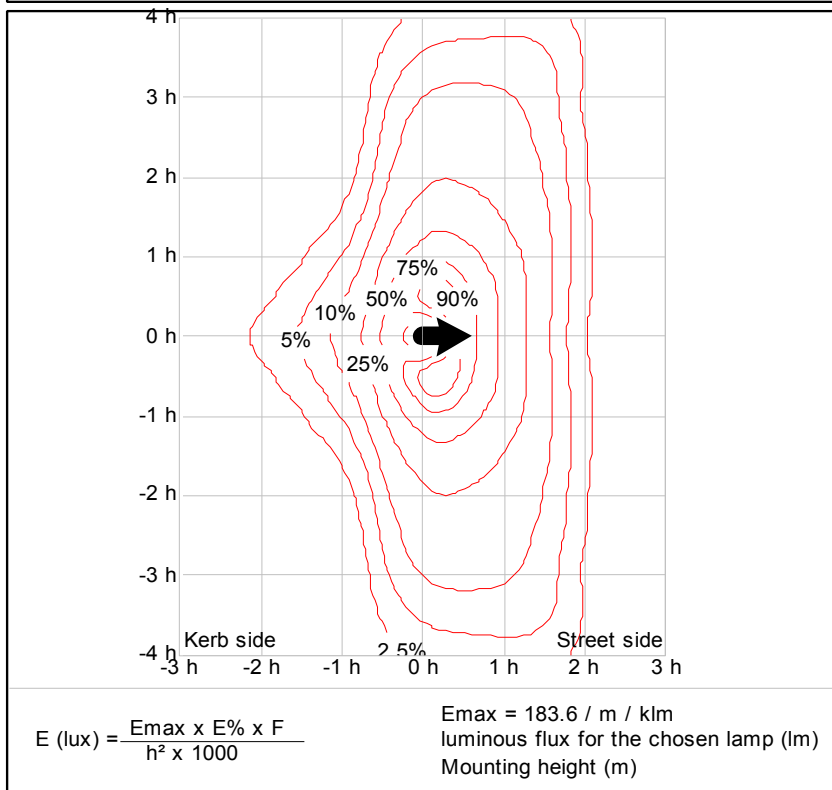
Alumet Control Direct LED

96274866 ALUMET CD 24L35-740 WSC-A CL LRT CL2 G4

THORN

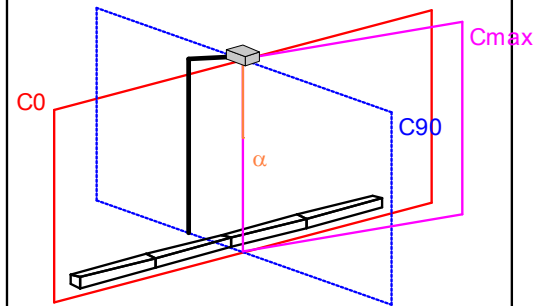


Measurement	ALCD24L35WSC4KG33
Catalogue number	Alumet CD 24L35 WSC 740
Lamps	1 x LED
Lamp adjustment	
IP	



Luminaire design attitude

Tilt: $\alpha = 0.0^\circ$



Maximum intensity

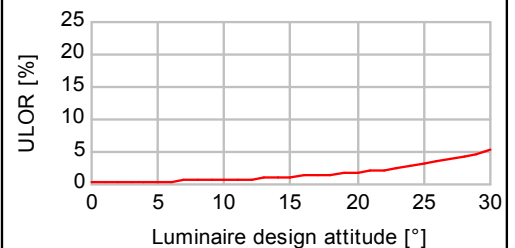
I_{max}	804 cd/klm
C_{max}	170°
γ_{max}	70°

Light Output Ratio

Luminaire design attitude	0.0°
LOR	100.00
ULOR	0.00
DLOR	100.00

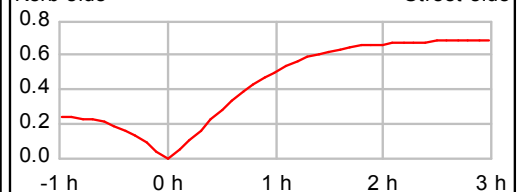
Upward light output ratio

3% for a tilt = 25°	5% for a tilt = 30°
10% for a tilt = 36°	15% for a tilt = 41°
20% for a tilt = 45°	25% for a tilt = 50°



Utilization Factors

0.5H = 0.28	1H = 0.50	2H = 0.67
Kerb side		Street side



Glare restriction Obtrusive light

Luminous intensity class G2

γ	Meas. Data I_{max} in cd/klm	Specified in EN 13201-2
70°	804	
80°	135	150
90°	9	30
>95°	3	

Photometric data file: TLLA_ALCD24L35WSC4KG33_DC.ltd



Stage C
ED4759-HCC-X
October 2020



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Home page: www.abacuslighting.com

Lighting Project: EXTERNAL FLOODLIGHTING			
Title: RANIKHET PRIMARY ACADEMY		Revision(s) From Previous Design:	
Design Ref:	UKS17841	LED DATA - 7.0	
Design By:	ROB SCOTT		
Date: 08/12/2020	Scale: 1:500 @ A2		

All illuminance values are the result of computer calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

FLOODLIGHTING EQUIPMENT:
4 x 10m MASTS (M1-M4)
M1-M4: 1 x AL80/120W/HTLS GEN 7
7 x 5m COLUMNS (C1-C7)
C1-C7: 1 x AL6100/30W/4K - 1m Outreach - Bracket 0° / Spike 0° / Lantern 0°

ILLUMINANCE LEVELS:

SPECIFIED LEVELS

MUGA

MAINTAINED

Em.ave = 200 LUX

UNIFORMITY

Emf/ave = 0.6

CARPARK

MAINTAINED

Em.ave = 20 LUX

UNIFORMITY

Emf/ave = 0.25

CALCULATED LEVELS

MUGA

MAINTAINED

E.ave = 285 LUX

UNIFORMITY

Emf/ave = 0.63

CARPARK

MAINTAINED

Em.ave = 23 LUX

UNIFORMITY

Emf/ave = 0.30

Max Glare Rating = 60

GRID VALUES IN LUX

GRID = 5m MUGA - 3m CARPARK

CONTOUR VALUES IN LUX

CONTOURS 2.5/10/25/50 LUX

MAINTENANCE FACTOR: 0.90

Based Upon:

- Luminaires depreciation due to dirt

- Medium Pollution

- Pre-season cleaning of floodlights

- LED Lifetime: 35,000hrs - AAA

- LED Lifetime: 50,000hrs - AL61000

Please Note: This design has been produced as an 'as built' plan.

Obtrusive Light - Compliance Report

CIE 150:2017, E3:Medium District Brightness, Pre-Curfew

Filename: agf7841

08/12/2020 13:44:25

Illuminance

Maximum Allowable Value: 10 Lux

Calculations Tested (Q):

Test Results

1. C1 Seg1 PASS

2. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS

3. C4 Seg1 PASS



Exterior lighting3

Installation : Ranikhet Academy Reading

Project number : P0221012

Customer :

Processed by :

Date : 12.02.2021

Project description:

Building height - approx. 6m

Luminaire height - Wall mounted at 2.5m

Working Plane: 0m.

Reflection Factors: 50% Walls, 20% Floor

Reflection Factors zeroed for emergency lighting calculations

Maintenance Factor: 0.8

Emergency lighting Maintenance Factor 0.8

The calculations predict illuminance levels based on the correct luminaire being installed as shown in this document. Any deviation to the product type or lamp type will render the calculations void. This similarly applies to changes of mounting height, reflection factors or maintenance factor.

Ensure that the design parameters meet the client specification

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur.

Guarantee claims for luminaire data are excluded.

Relux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



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Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



1 Luminaire data

1.1 Complete Lighting Services Limited, Wall mounted downlight IP65 (E5594-LBN-40)

1.1.1 Data sheet

Manufacturer: Complete Lighting Services Limited

E5594-LBN-40 Wall mounted downlight IP65

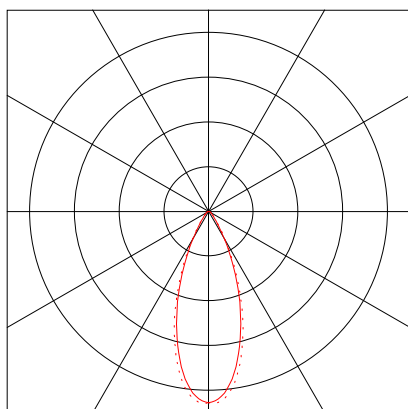
Luminaire data

Luminaire efficiency : 45.63%
Luminaire efficacy : 48.98 lm/W
Classification : A70 ↓100.0% ↑0.0%
CIE Flux Codes : 89 97 99 100 45
UGR 4H 8H : 16.5 / 16.8
Power : 25.9 W
Luminous flux : 1268.5 lm

Dimensions : Ø140 mm x 350 mm

Equipped with

Quantity : 1
Designation : LED
Colour : 4000K
Luminous flux : 2780 lm
Colour reproduction : 80



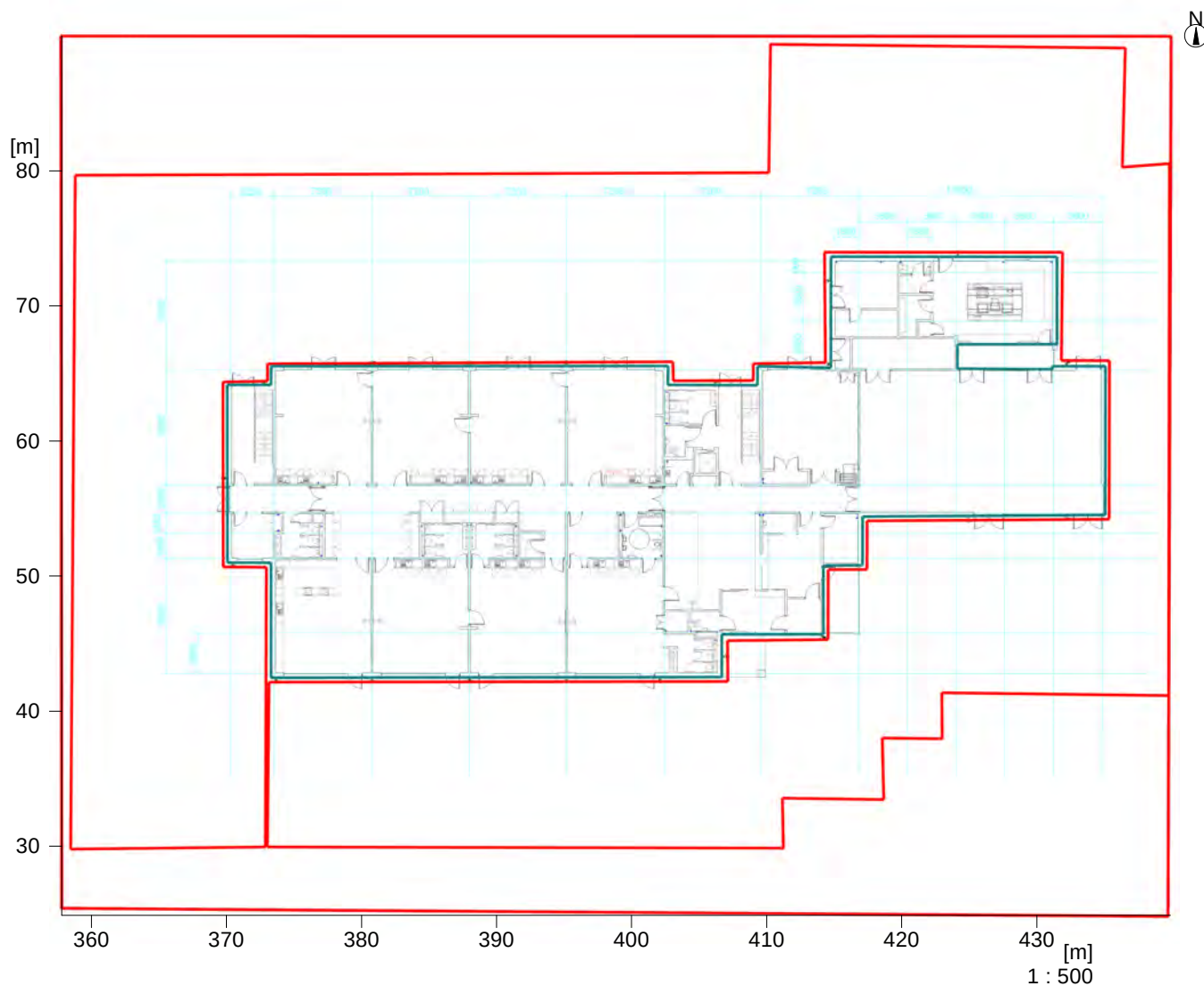
Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2 Building Exterior 3 - Ranikhet

2.1 Description, Building Exterior 3 - Ranikhet

2.1.1 Floor plan

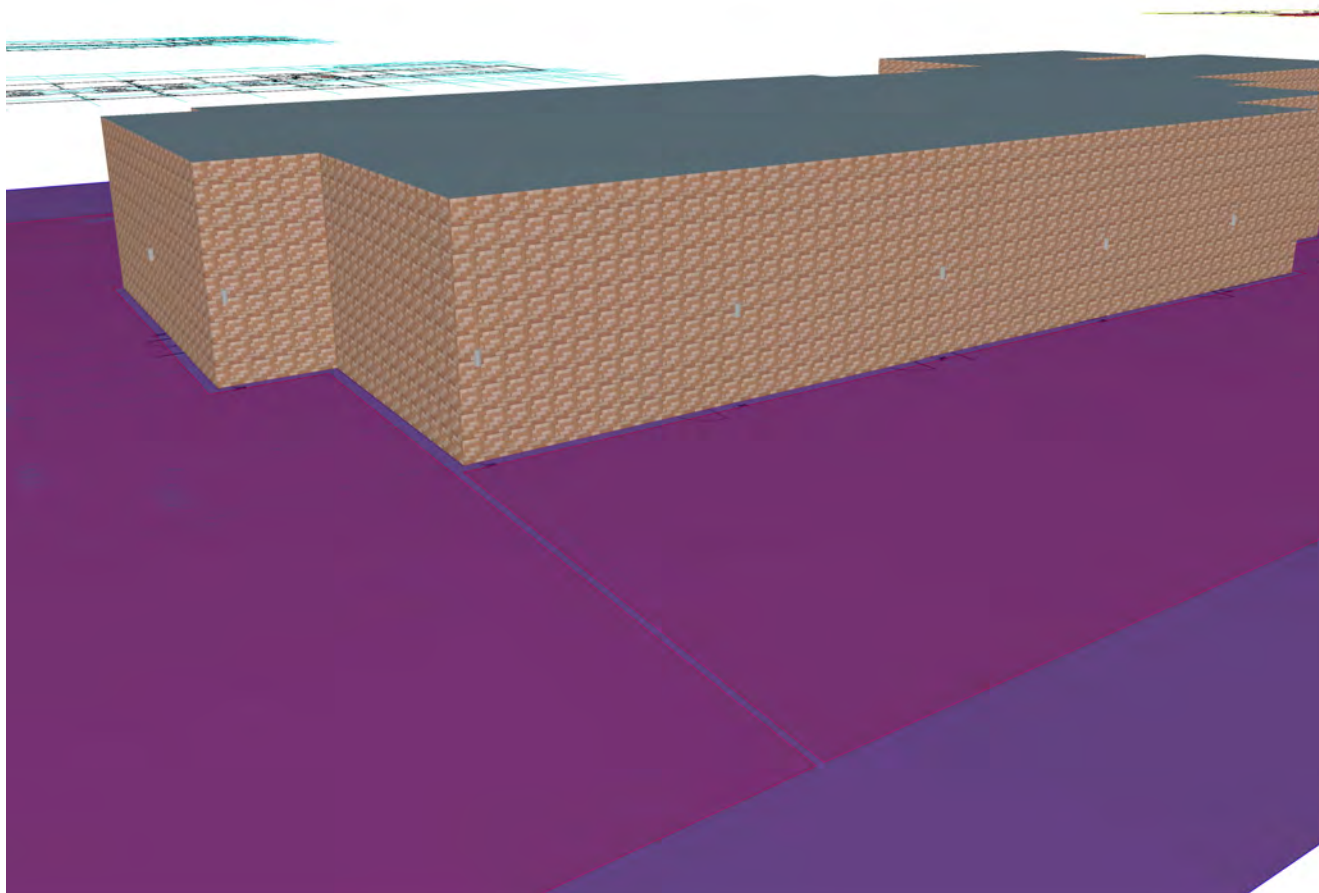


Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.1 Description, Building Exterior 3 - Ranikhet

2.1.2 3D view, View 1



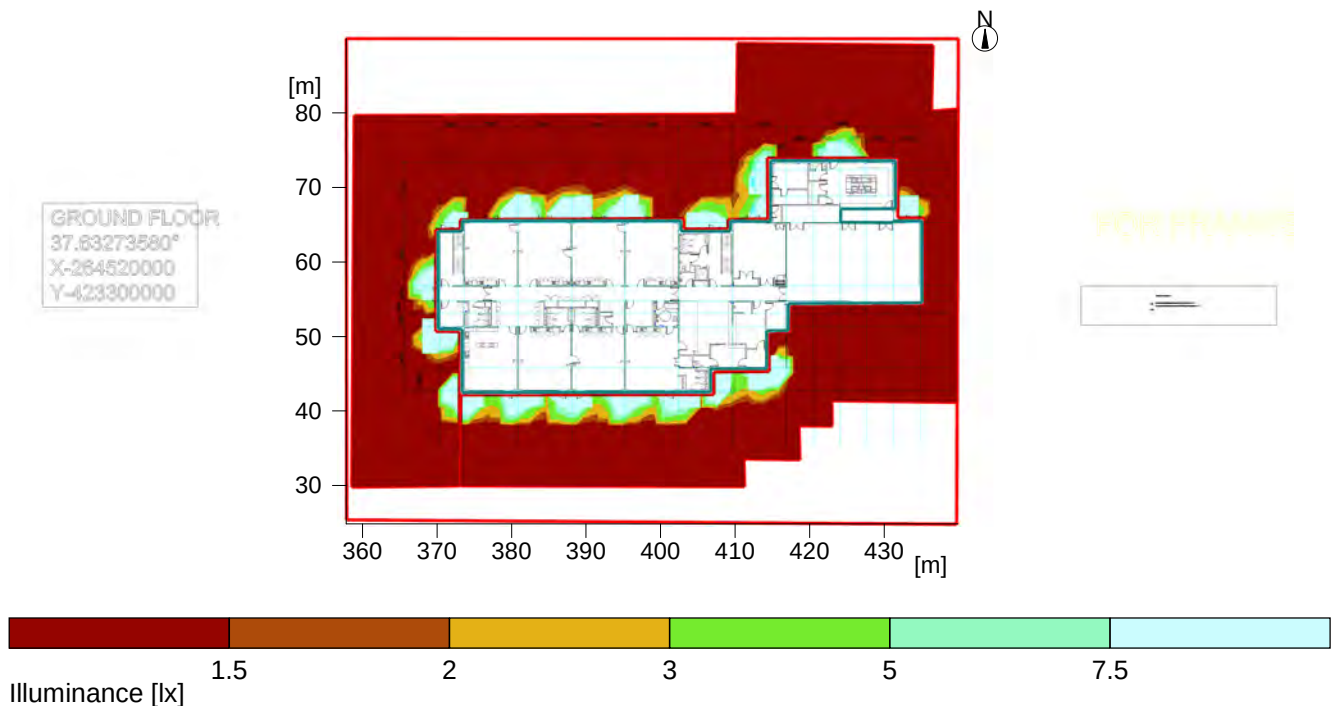
Object : Exterior lighting3
 Installation : Ranikhet Academy Reading
 Project number : P0221012
 Date : 12.02.2021



2 Building Exterior 3 - Ranikhet

2.2 Summary, Building Exterior 3 - Ranikhet

2.2.1 Result overview, Ground - (0m)



General

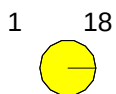
Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
photometric centre height. [m]:	2.50 m
Maintenance factor	0.80

Total luminous flux of all lamps	50040 lm
Total power	466.2 W
Total power per area (5310.91 m²)	0.09 W/m²

Illuminance

Average illuminance	Eav	3 lx
Minimum illuminance	Emin	0 lx
Maximum illuminance	Emax	211 lx
Uniformity Uo	Emin/Em	1:--- (---)
Diversity Ud	Emin/Emax	1:--- (---)

Type No. \Make



Complete Lighting Services Limited

Order No. : E5594-LBN-40
 Luminaire name : Wall mounted downlight IP65
 Equipment : 1 x LED 25.9 W / 2780 lm

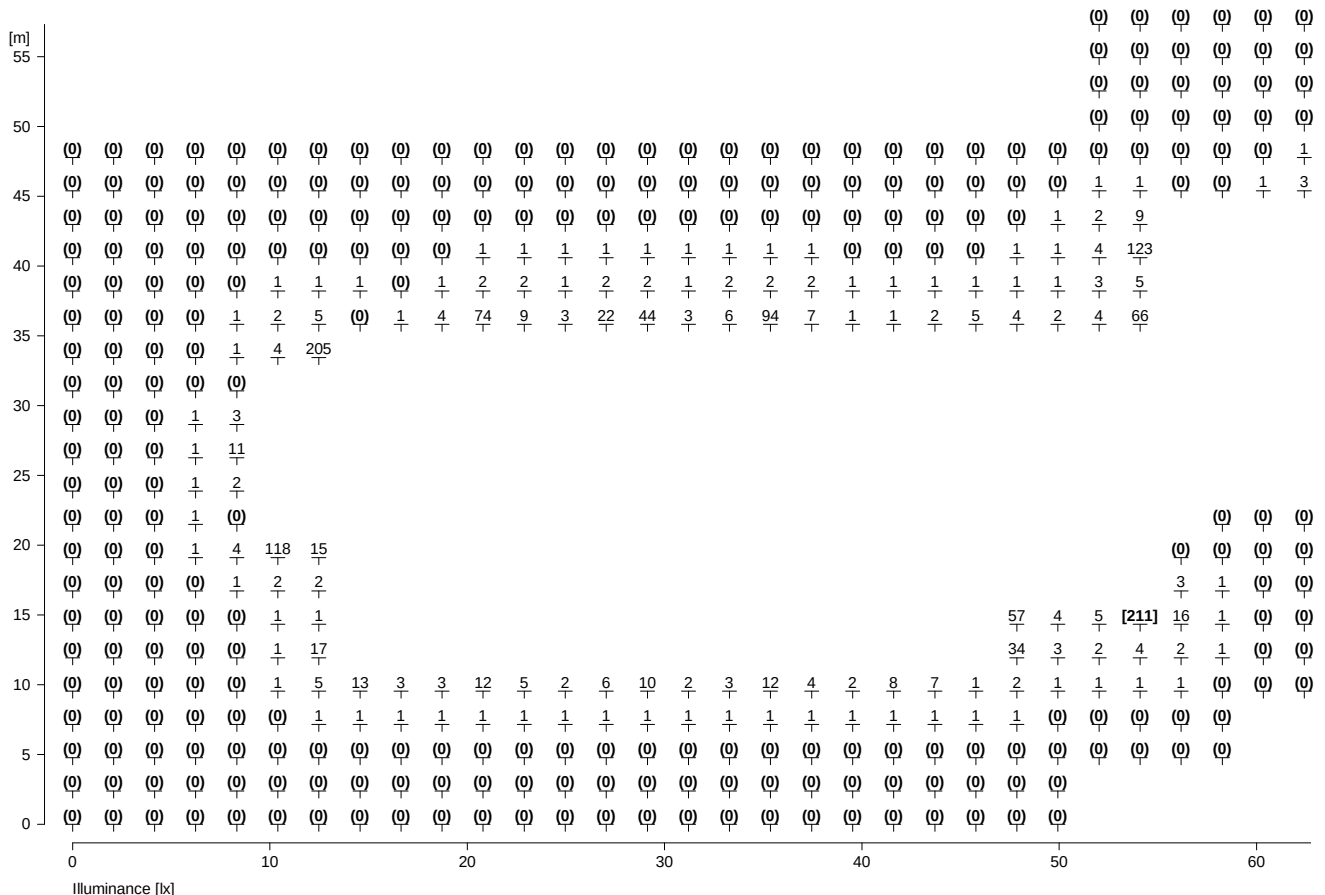
Object : Exterior lighting3
 Installation : Ranikhet Academy Reading
 Project number : P0221012
 Date : 12.02.2021



2 Building Exterior 3 - Ranikhet

2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.1 Table, Ground - (0m) (E)



Part1

Height of the reference plane

Average illuminance	Eav	: 0.00 m
Minimum illuminance	Emin	: 3 lx
Maximum illuminance	Emax	: 0 lx
Uniformity Uo	Emin/Eav	: 211 lx
Diversity Ud	Emin/Emax	: ---

Object : Exterior lighting3
 Installation : Ranikhet Academy Reading
 Project number : P0221012
 Date : 12.02.2021



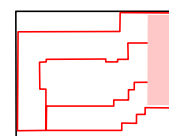
2 Building Exterior 3 - Ranikhet

2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.1 Table, Ground - (0m) (E)

(0)	(0)	(0)	(0)	(0)	(0)			
(0)	(0)	(0)	(0)	(0)	(0)			
(0)	(0)	(0)	(0)	(0)	(0)			
(0)	(0)	(0)	(0)	(0)	(0)			
$\frac{1}{6}$	$\frac{1}{2}$	(0)	(0)	(0)	(0)	(0)	(0)	
$\frac{6}{1}$	$\frac{2}{1}$	$\frac{1}{1}$	(0)	(0)	(0)	(0)	(0)	
			(0)	(0)	(0)	(0)	(0)	
			$\frac{1}{1}$	(0)	(0)	(0)	(0)	
			$\frac{2}{1}$	$\frac{1}{1}$	(0)	(0)	(0)	
			$\frac{106}{1}$	$\frac{4}{1}$	$\frac{1}{1}$	(0)	(0)	
						(0)	(0)	
						(0)	(0)	
						(0)	(0)	
						(0)	(0)	
						(0)	(0)	
(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	
(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	

70 [m]



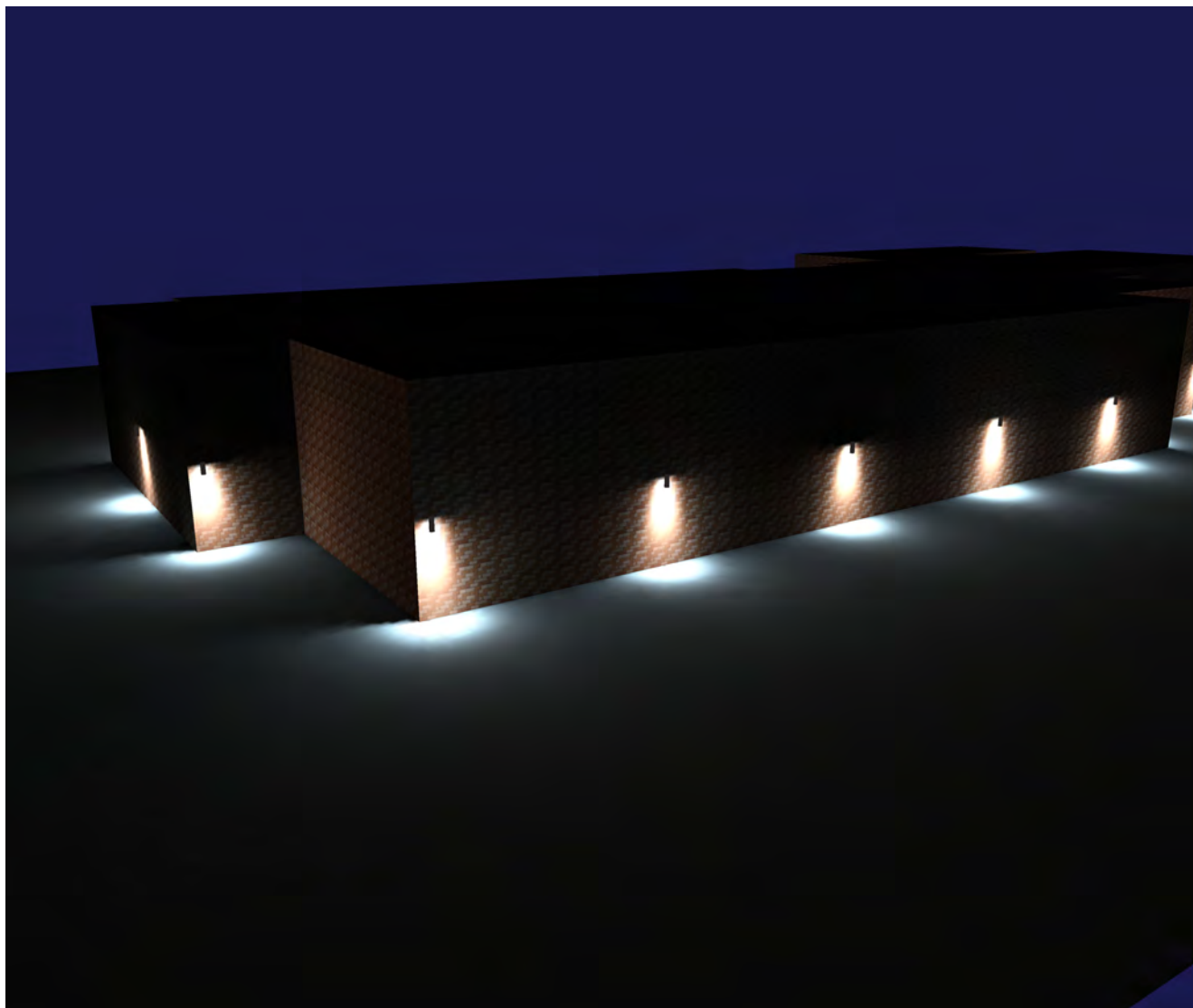
Part2

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.2 3D luminance, View 1



Luminance in the scene

Minimum: : 0 cd/m²

Maximum: : 192 cd/m²

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.3 3D luminance, View 2



Luminance in the scene

Minimum: : 0 cd/m²

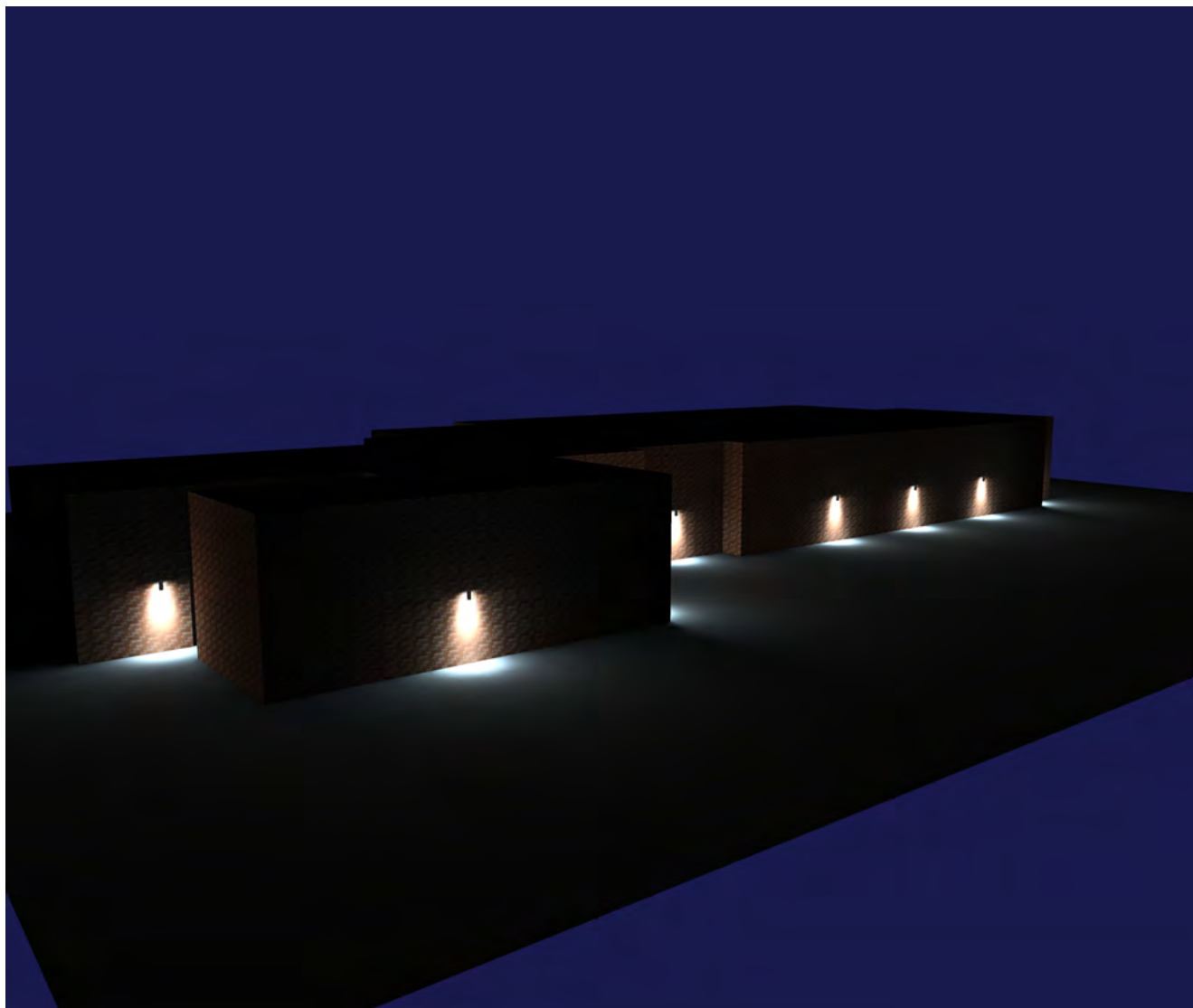
Maximum: : 192 cd/m²

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.4 3D luminance, View 3



Luminance in the scene

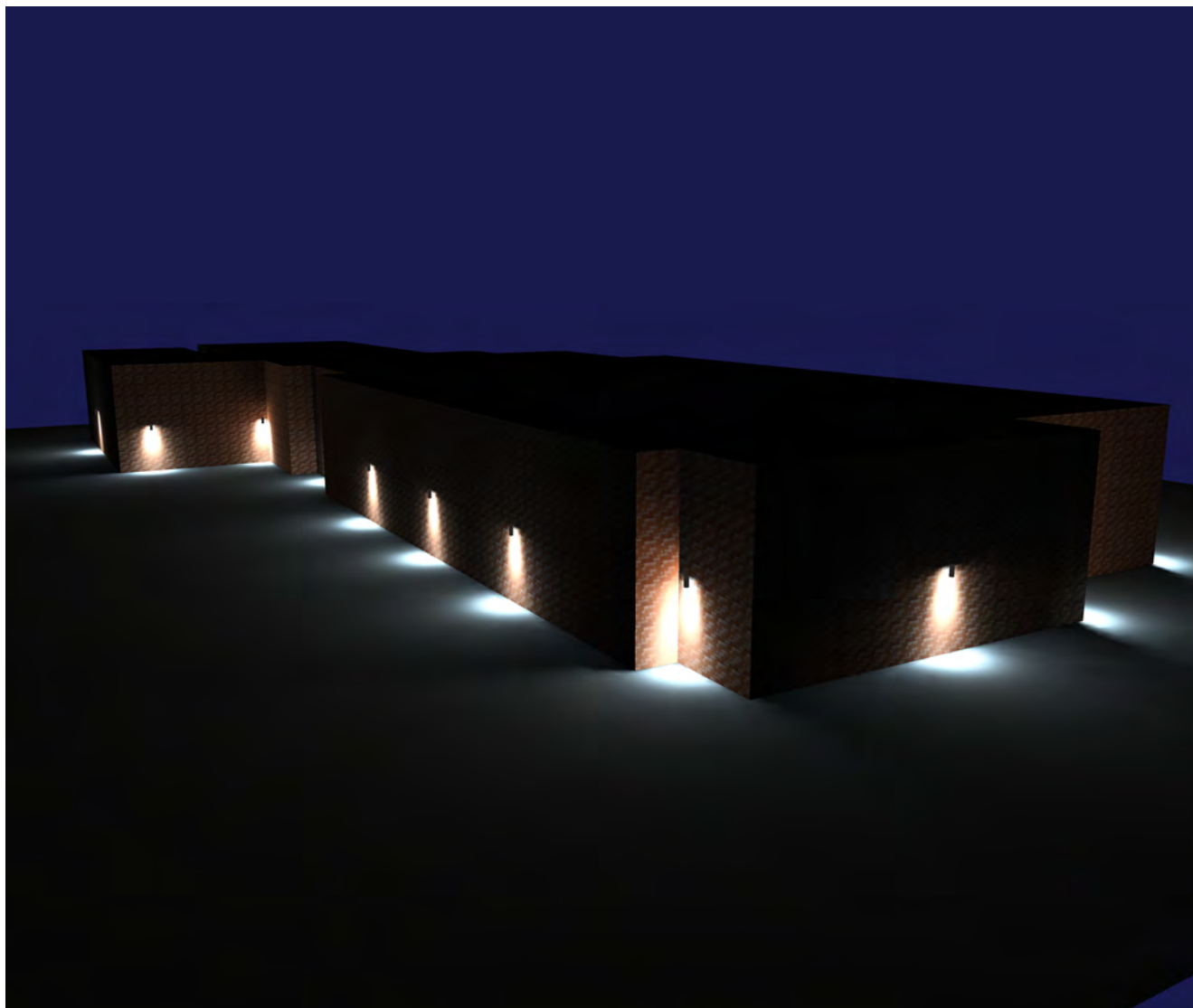
Minimum: : 0 cd/m²
Maximum: : 192 cd/m²

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.3 Calculation results, Building Exterior 3 - Ranikhet

2.3.5 3D luminance, View 4



Luminance in the scene

Minimum: : 0 cd/m²

Maximum: : 192 cd/m²

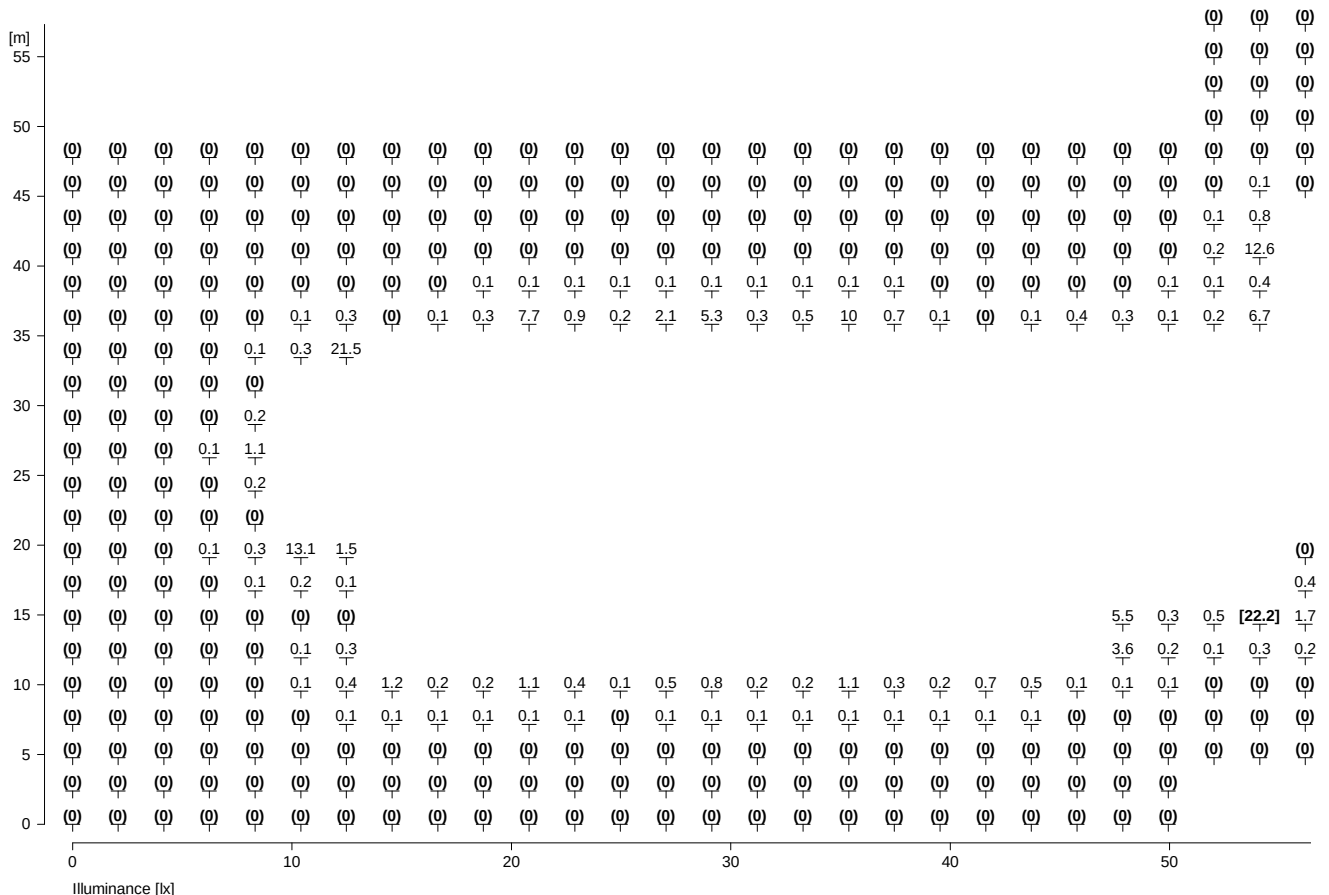
Object : Exterior lighting3
 Installation : Ranikhet Academy Reading
 Project number : P0221012
 Date : 12.02.2021



2 Building Exterior 3 - Ranikhet

2.4 Calculation results, Building Exterior 3 - Ranikhet

2.4.1 Table, Ground - (0m) - Emergency (E)



Part1

Required minimum illuminance : 0.5 lx

Minimum illuminance Emin : 0 lx (* 0 lx)
 Maximum illuminance Emax : 22 lx (* 32 lx)
 Uniformity Emin/Emax : --- (Threshold value 1:40) (* 1:---)
 Height : 0 m
 Calculation algorithm used : Direct component
 Maintenance factor : 0.8

*: Values on fine measuring grid (0.1m - 0.5m)!

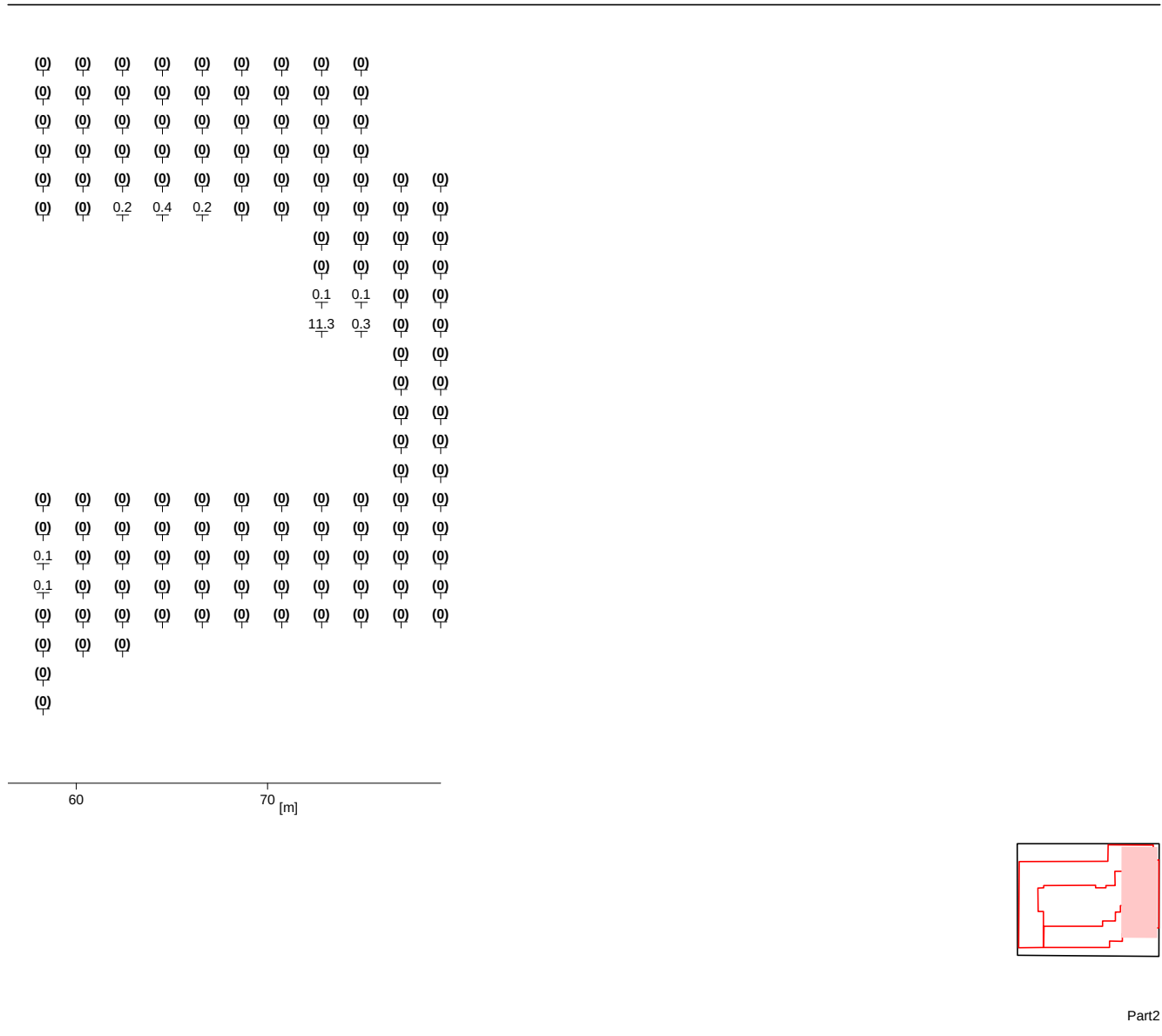
Object : Exterior lighting3
 Installation : Ranikhet Academy Reading
 Project number : P0221012
 Date : 12.02.2021



2 Building Exterior 3 - Ranikhet

2.4 Calculation results, Building Exterior 3 - Ranikhet

2.4.1 Table, Ground - (0m) - Emergency (E)



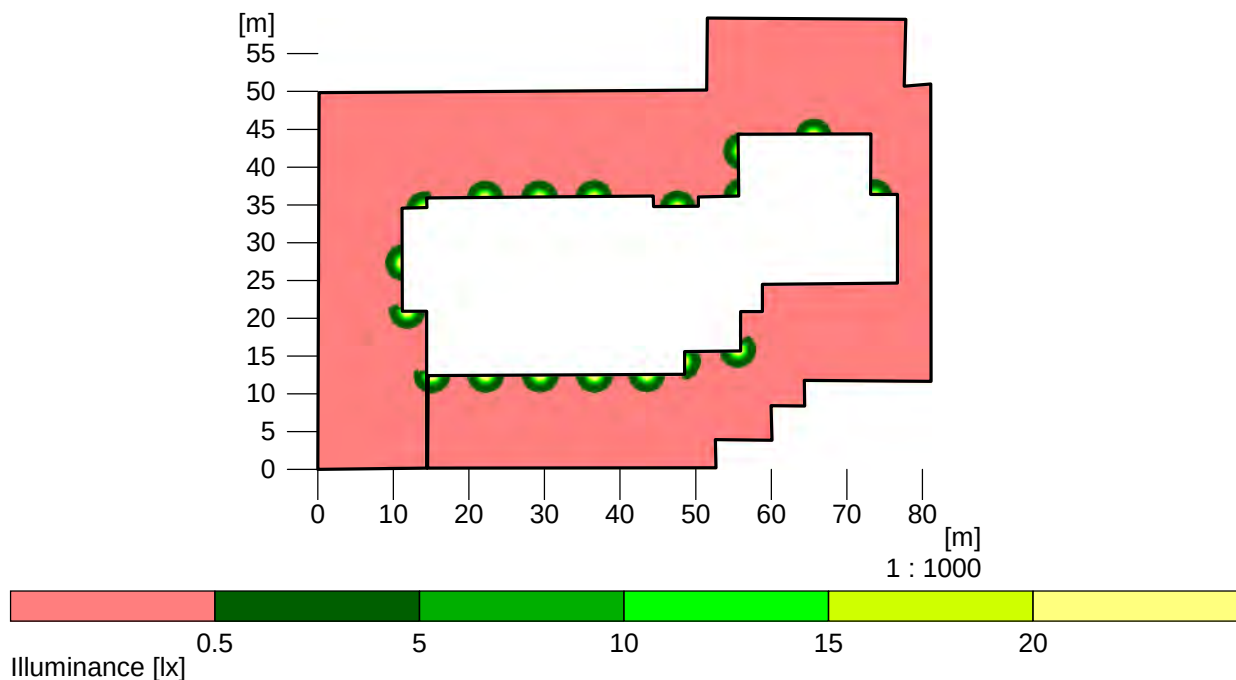
Part2

Object : Exterior lighting3
Installation : Ranikhet Academy Reading
Project number : P0221012
Date : 12.02.2021



2.4 Calculation results, Building Exterior 3 - Ranikhet

2.4.2 Boundary line, Ground - (0m) - Emergency (E)



Required minimum illuminance		: 0.5 lx
Minimum illuminance	Emin	: 0 lx
Maximum illuminance	Emax	: 32 lx
Uniformity	Emin/Emax	: --- (Threshold value 1:40)
Height		: 0 m
Calculation algorithm used		: Direct component
Maintenance factor		: 0.8



Exterior Lighting1

Installation : Ranikhet Academy, Reading

Project number : P0321005

Customer :

Processed by :

Date : 12.03.2021

Project description:

Column mounting 3m and 4m

Luminaire height: Y Type luminaire 3m column T Type luminaire 4m column

Working Plane: 0m.

Reflection Factors: 50% Walls, 20% Floor

Reflectance Factors zeroed for Emergency Lighting calculations.

Maintenance Factor: 0.8

The calculations predict illuminance levels based on the correct luminaire being installed as shown in this document. Any deviation to the product type or lamp type will render the calculations void. This similarly applies to changes of mounting height, reflection factors or maintenance factor.

Ensure that the design parameters meet the client specification

The following values are based on exact calculations on calibrated lamps, luminaires and their arrangement. In practice, gradual divergences can occur.

Guarantee claims for luminaire data are excluded.

Relux and the luminaire manufacturers accept no liability for consequential damage and damage which is occasioned to the user or to third parties.

Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



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Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



1 Luminaire data

1.1 Complete Lighting Services Limited, Wall mounted downlight IP65 (E5594-LBN-40)

1.1.1 Data sheet

Manufacturer: Complete Lighting Services Limited

E5594-LBN-40 Wall mounted downlight IP65

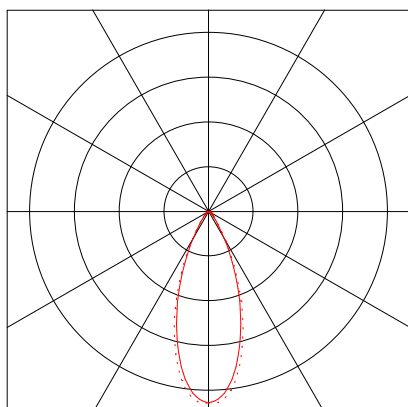
Luminaire data

Luminaire efficiency : 45.63%
Luminaire efficacy : 48.98 lm/W
Classification : A70 ↓100.0% ↑0.0%
CIE Flux Codes : 89 97 99 100 45
UGR 4H 8H : 16.5 / 16.8
Power : 25.9 W
Luminous flux : 1268.5 lm

Equipped with

Quantity : 1
Designation : LED
Colour : 4000K
Luminous flux : 2780 lm
Colour reproduction : 80

Dimensions : Ø140 mm x 350 mm



Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



1 Luminaire data

1.2 Thorn - Les Andelys, ALUMET CD 24L35-740 WS... (!96274866 (STD ...)

1.2.1 Data sheet

Manufacturer: Thorn - Les Andelys

!96274866 (STD - standard)

ALUMET CD 24L35-740 WSC-A CL LRT CL2 G4

Luminaire data

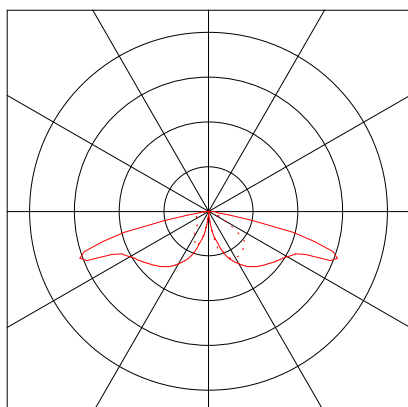
Luminaire efficiency : 100%
Luminaire efficacy : 113.15 lm/W
Classification : A20 ↓99.7% ↑0.3%
CIE Flux Codes : 31 64 93 100 100
UGR 4H 8H : 27.1 / 11.3
Power : 27 W
Luminous flux : 3055 lm

Equipped with

Quantity : 1
Designation :

Colour : 4000
Luminous flux : 3055 lm
Colour reproduction : 70

Dimensions : Ø200 mm x 1250 mm



Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



1 Luminaire data

1.3 ASD Lighting PLC, HIGHWAY DIAMOND ELITE ... (HWD2-B4LED08350-M1)

1.3.1 Data sheet

Manufacturer: ASD Lighting PLC

HWD2-B4LED08350-M1
IP66

HIGHWAY DIAMOND ELITE MICRO BLACK 4000K LED 8 350mA M1 OPTIC

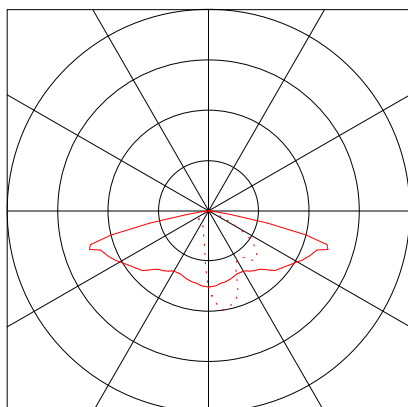
Luminaire data

Luminaire efficiency : 100%
Luminaire efficacy : 101.1 lm/W
Classification : A30 ↓100.0% ↑0.0%
CIE Flux Codes : 33 67 96 100 100
UGR 4H 8H : 35.5 / 11.0
Power : 10.9 W
Luminous flux : 1102 lm

Equipped with

Quantity : 8
Designation : LED
Colour : 4000
Luminous flux : 137.8 lm
Colour reproduction : 72

Dimensions : 250 mm x 165 mm x 120 mm



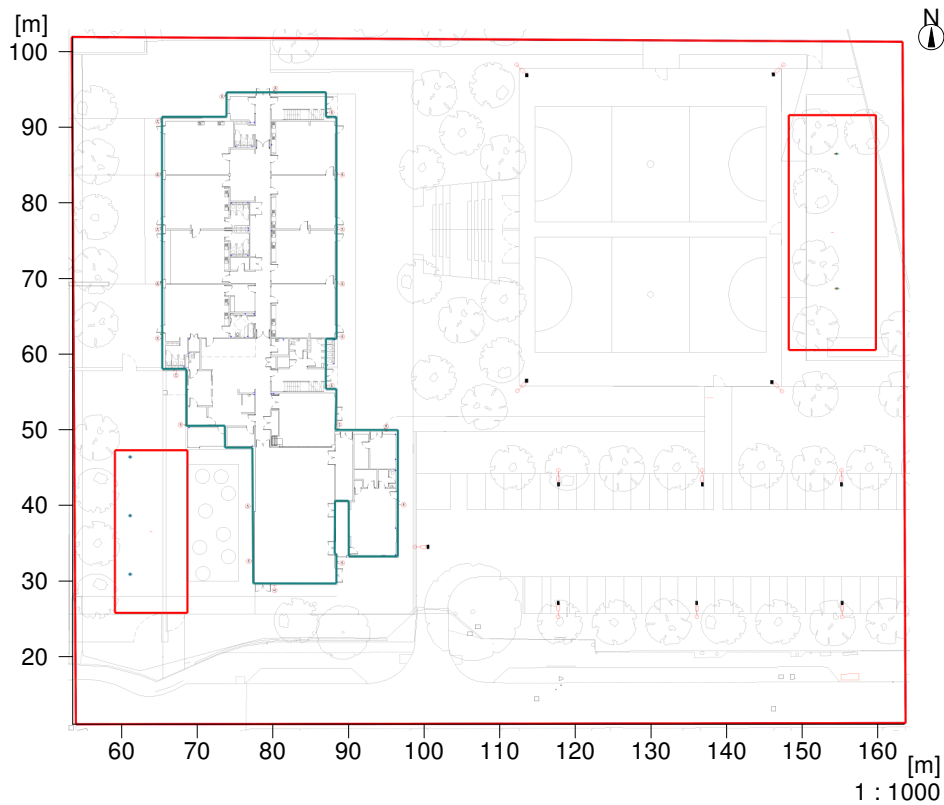
Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



2 Exterior 1

2.1 Description, Exterior 1

2.1.1 Floor plan

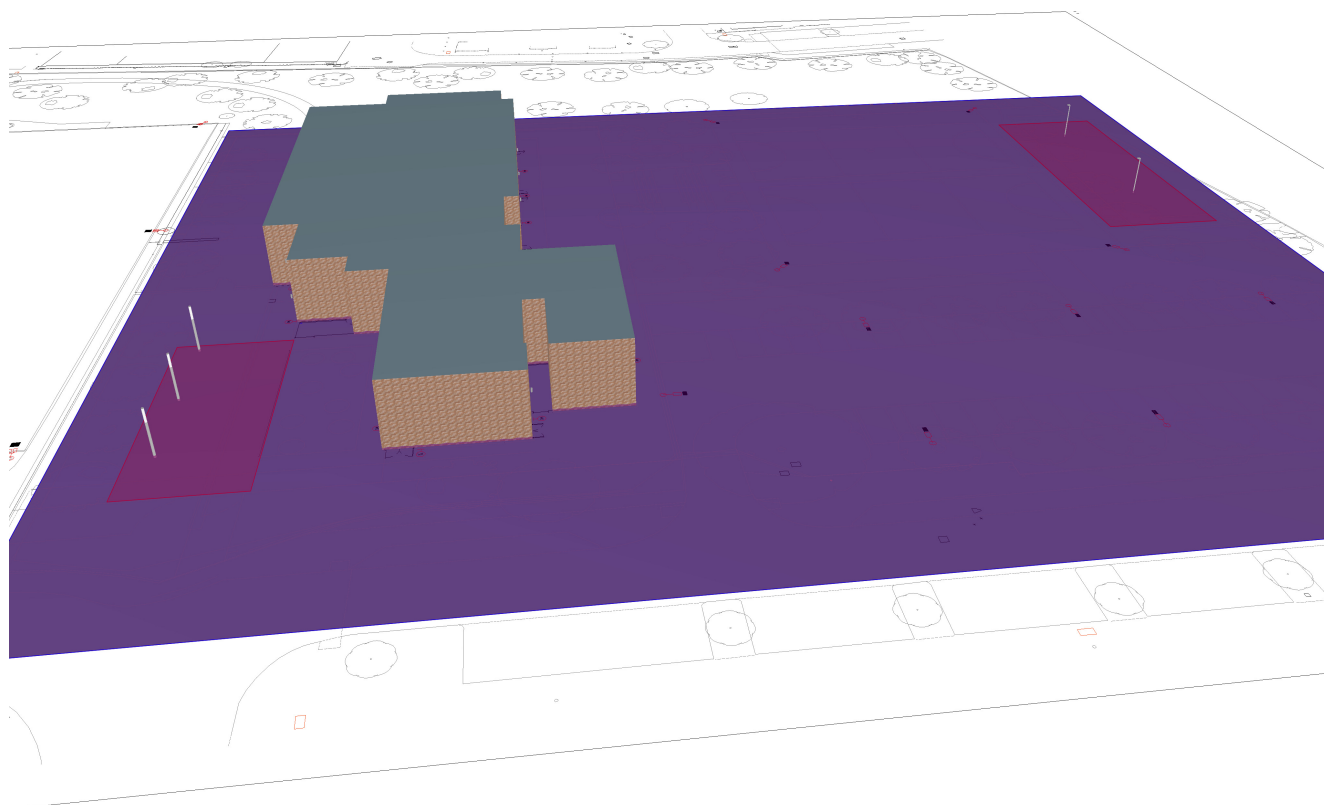


Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



2.1 Description, Exterior 1

2.1.2 3D view, View 1



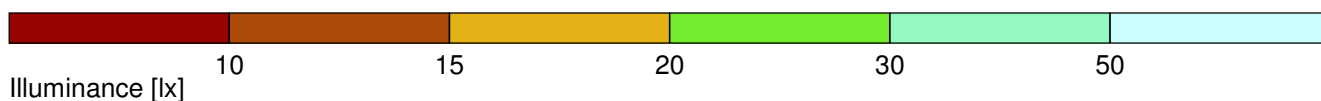
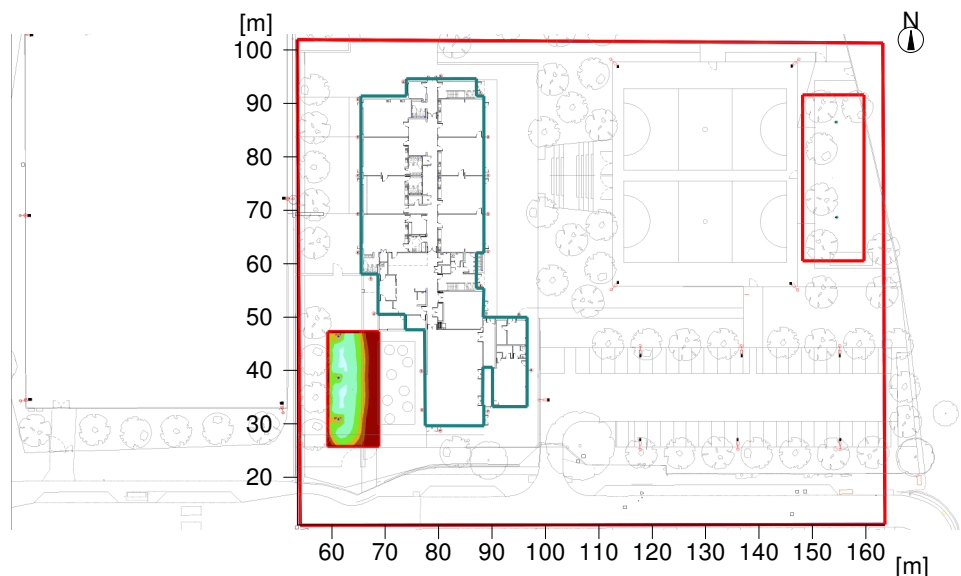
Object : Exterior Lighting1
 Installation : Ranikhet Academy, Reading
 Project number : P0321005
 Date : 12.03.2021



2 Exterior 1

2.2 Summary, Exterior 1

2.2.1 Result overview, Area 1



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Maintenance factor	0.80

Total luminous flux of all lamps	11369 lm
Total power	102.8 W
Total power per area (9905.61 m ²)	0.01 W/m ²

Illuminance

Average illuminance	Eav	22.5 lx
Minimum illuminance	Emin	2.1 lx
Maximum illuminance	Emax	53.6 lx
Uniformity U ₀	Emin/Em	1:10.6 (0.09)
Diversity U _d	Emin/Emax	1:25.3 (0.04)

Type No. Make

2	3	Thorn - Les Andelys
		Order No. : I96274866 (STD - standard)
		Luminaire name : ALUMET CD 24L35-740 WSC-A CL LRT CL2 G4
		Equipment : 1 x ALUL_24L35WSC4KCL 27W 27 W / 3055 lm



Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



2 Exterior 1

2.2 Summary, Exterior 1

2.2.1 Result overview, Area 1

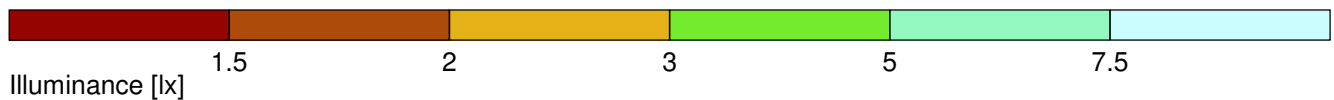
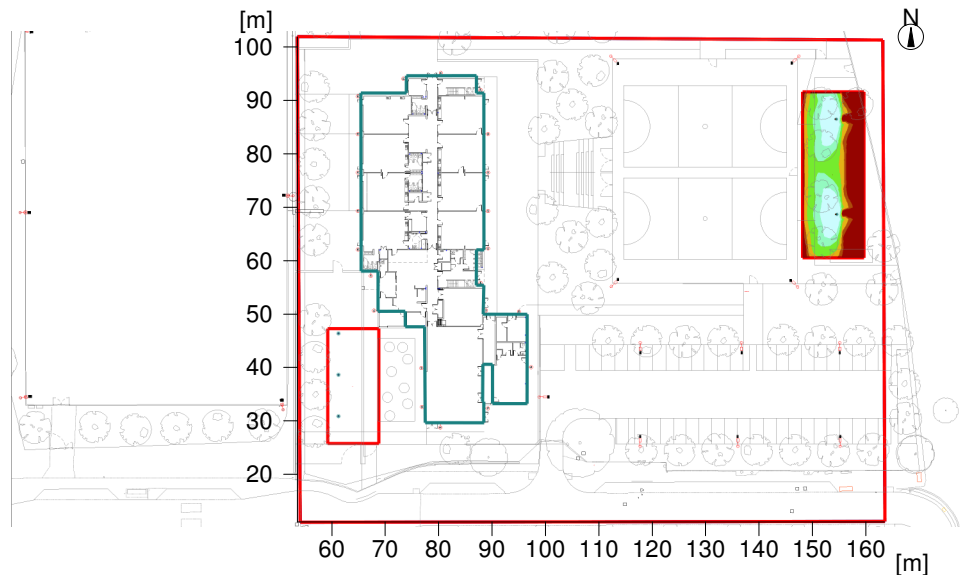
		ASD Lighting PLC
3	2	Order No. : HWD2-B4LED08350-M1
		Luminaire name : HIGHWAY DIAMOND ELITE MICRO BLACK 4000K LED 8 350mA M1 OPT IC IP66
		Equipment : 8 x LED / 137.75 lm

Object : Exterior Lighting1
 Installation : Ranikhet Academy, Reading
 Project number : P0321005
 Date : 12.03.2021



2.2 Summary, Exterior 1

2.2.2 Result overview, Area 2



General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	-0.00 m
Maintenance factor	0.80

Total luminous flux of all lamps	11369 lm
Total power	102.8 W
Total power per area (9905.61 m²)	0.01 W/m²

Illuminance

Average illuminance	Eav	3.9 lx
Minimum illuminance	Emin	0.1 lx
Maximum illuminance	Emax	19.6 lx
Uniformity Uo	Emin/Em	1:54.9 (0.02)
Diversity Ud	Emin/Emax	1:275 (0)

Type No. Make

2	3	Thorn - Les Andelys
		Order No. : I96274866 (STD - standard)
		Luminaire name : ALUMET CD 24L35-740 WSC-A CL LRT CL2 G4
		Equipment : 1 x ALUL_24L35WSC4KCL 27W 27 W / 3055 lm

Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



2.2 Summary, Exterior 1

2.2.2 Result overview, Area 2

		ASD Lighting PLC
3	2	Order No. : HWD2-B4LED08350-M1
		Luminaire name : HIGHWAY DIAMOND ELITE MICRO BLACK 4000K LED 8 350mA M1 OPT IC IP66
		Equipment : 8 x LED / 137.75 lm

Object : Exterior Lighting1
 Installation : Ranikhet Academy, Reading
 Project number : P0321005
 Date : 12.03.2021



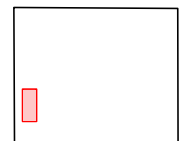
2 Exterior 1

2.3 Calculation results, Exterior 1

2.3.1 Table, Area 1 (E)

[m]	19.2	13.9	11	32.2	34.5	24.3	16.1	9.2	4.9	2.5
20	20.6	16.3	18.4	33.5	36	25.6	17.2	9.9	5.2	2.7
	22.8	30.8	38.7	45.5	36.5	27.1	18.6	11	5.8	3
18	22	38	50.3	46.5	37.2	28.4	19.7	11.9	6.2	3.2
	19.8	36.5	49.2	45.9	38.1	28.4	20.9	12.7	6.5	3.3
16	20.4	37.4	50.5	47.3	39.2	29.5	21.3	13	6.6	3.2
	23.4	40.4	53.6	50.1	41	30.3	21.4	12.8	6.5	3.2
14	24.7	34.2	41.5	50.7	41.2	30.7	21.2	12.4	6.4	3.2
	21.7	17.4	17.6	39.7	41.3	30	20.5	12.1	6.3	3.1
12	22.5	25.5	25.1	39.9	41.6	30.4	20.8	12.2	6.3	3.1
	24.2	33.6	43.3	50.3	40.9	30.7	21.2	12.5	6.5	3.2
10	22.6	39.7	52.7	49.5	39.8	30.6	21.2	12.8	6.5	3.2
	19.9	36.9	49.7	46.5	38.8	28.7	21.3	12.9	6.5	3.3
8	20.2	36.7	49.4	46	37.8	28.5	20.3	12.6	6.5	3.2
	22.5	38.4	50.6	46.5	37.9	27.6	19.5	11.7	6.1	3.1
6	23.1	31.1	36	37	36.3	26.8	18.2	10.7	5.6	2.9
	19.3	12.2	10.9	33.3	35.1	24.9	16.6	9.6	5	2.7
4	19.2	20.4	17.7	31.5	34.4	24.2	16.1	9.2	4.8	2.5
	19.8	25.8	32.5	39.3	31.5	23	15.5	8.8	4.6	2.4
2	16.6	28.6	37.2	34.7	27.1	21	14.3	8.4	4.3	2.3
	11.6	21.2	28.3	26.6	22.3	16.8	12.8	7.9	4.2	2.2
0	8.2	14.9	20.6	19.8	17.2	13.6	10.4	7.2	4.1	(2.1)
	0	1	2	3	4	5	6	7	8	[m]

Illuminance [lx]



Height of the reference plane

Average illuminance	Eav	: 0.00 m
Minimum illuminance	Emin	: 2.1 lx
Maximum illuminance	Emax	: 53.6 lx
Uniformity Uo	Emin/Eav	: 1 : 10.62 (0.09)
Diversity Ud	Emin/Emax	: 1 : 25.29 (0.04)

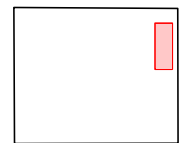
Object : Exterior Lighting1
 Installation : Ranikhet Academy, Reading
 Project number : P0321005
 Date : 12.03.2021



2.3 Calculation results, Exterior 1

2.3.2 Table, Area 2 (E)

	1.7	3.3	5.1	6.7	6.8	5.2	1.4	0.7	0.5	0.3
	1.9	3.4	4.7	7.8	9	6.8	1.7	0.9	0.6	0.5
[m]	2.1	3.8	5.1	8	11.7	8.9	2.2	1.4	0.9	0.7
27.5	2.3	4.2	5.9	8.5	16	11.9	2.9	1.8	1.1	(0.1)
	2.5	4.5	6.5	9	[19.6]	13.9	0.2	(0.1)	(0.1)	(0.1)
25.0	2.5	4.4	6.1	8.8	17.5	12.8	3.2	1.9	1.2	(0.1)
	2.4	4.2	5.6	8.3	12.6	9.8	2.6	1.6	1.1	0.7
22.5	2.3	3.9	5.2	8.4	10.1	7.8	2.1	1.3	0.9	0.6
	2.2	3.9	5.8	7.8	8	6.2	1.9	1.1	0.7	0.4
20.0	2.1	4	6	6.7	6.3	4.8	2.1	1	0.6	0.3
	2.1	4.1	5.3	5.5	5	3.9	2.2	0.9	0.5	0.2
17.5	2.2	3.9	4.8	4.8	4.3	3.4	2.2	0.9	0.3	0.2
	2.2	3.7	4.5	4.5	4	3.2	2.3	0.8	0.3	0.2
15.0	2.2	3.9	4.7	4.6	4.1	3.4	2.3	0.8	0.3	0.2
	2.1	4	5.1	5.2	4.7	3.8	2.3	0.9	0.4	0.2
12.5	2.1	4	5.8	6.3	5.9	4.6	2.3	1	0.5	0.3
	2.1	3.9	5.9	7.4	7.4	6	2	1.1	0.7	0.4
10.0	2.2	3.8	5.2	8.1	9.4	7.3	2.1	1.3	0.8	0.5
	2.3	4	5.4	8	11.9	9.5	2.5	1.6	1	0.7
7.5	2.4	4.2	6	8.3	15.6	12.8	3.1	1.9	1.2	(0.1)
	2.4	4.4	6.5	8.8	19.2	15.2	0.2	0.2	(0.1)	(0.1)
5.0	2.3	4.2	6	8.4	17.4	13.8	3.3	1.9	1.2	(0.1)
	2.1	3.8	5.3	7.7	12.5	10.2	2.5	1.5	1	0.7
2.5	1.9	3.4	4.6	7.6	9.9	7.7	1.9	1.1	0.7	0.5
	1.7	3.2	4.9	7	7.5	5.9	1.5	0.8	0.5	0.4
0.0	1.4	3	4.8	5.6	5.5	4.3	1.5	0.6	0.4	0.3
	1.3	2.8	4	4.2	3.9	3.1	1.6	0.4	0.3	0.2
	1.2	2.4	3.1	3.1	2.9	2.3	1.4	0.4	0.2	(0.1)



Height of the reference plane

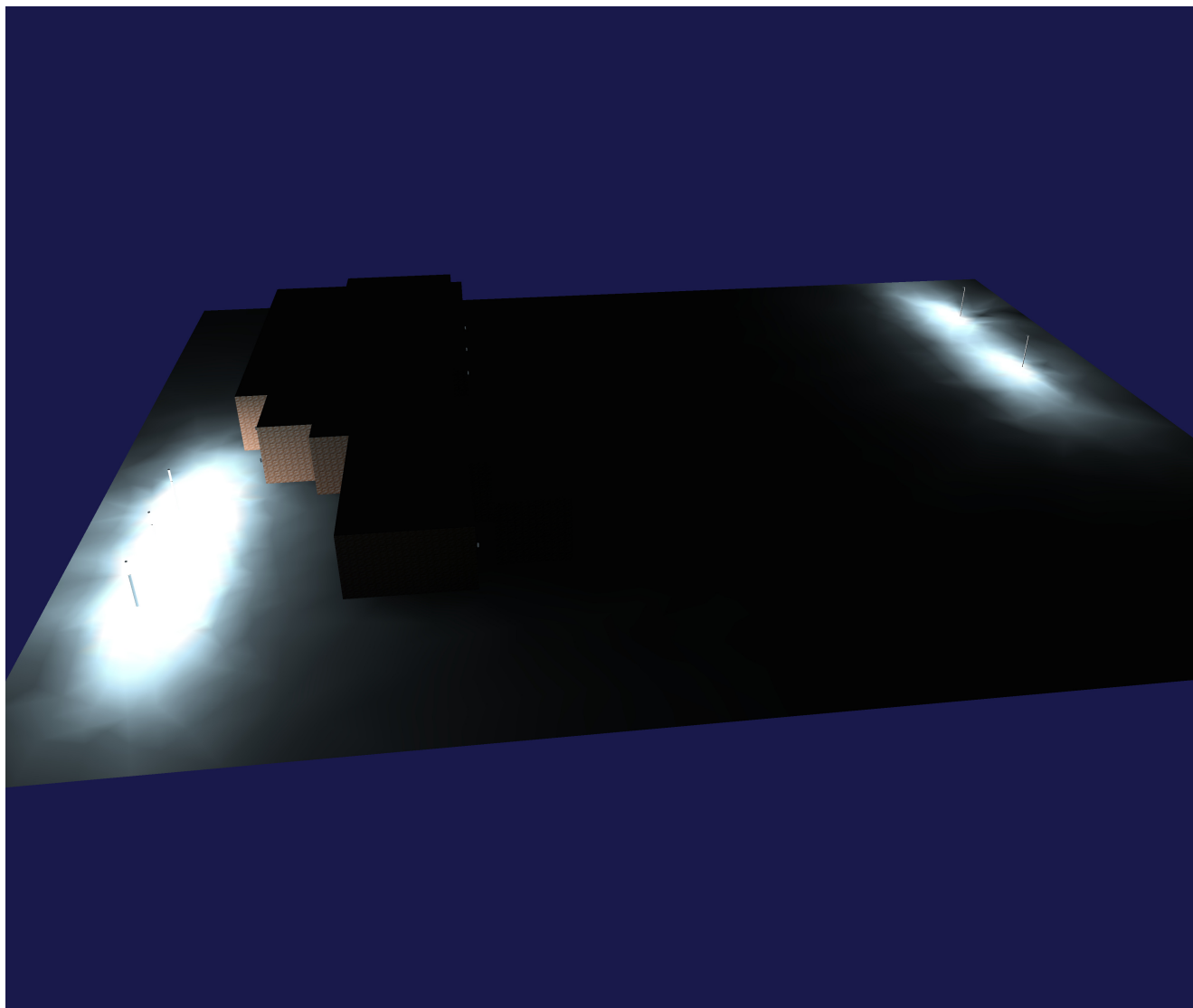
Average illuminance	Eav	: 0.00 m
Minimum illuminance	Emin	: 0.1 lx
Maximum illuminance	Emax	: 19.6 lx
Uniformity Uo	Emin/Eav	: 1 : 54.89 (0.02)
Diversity Ud	Emin/Emax	: 1 : 274.53 (0.00)

Object : Exterior Lighting1
Installation : Ranikhet Academy, Reading
Project number : P0321005
Date : 12.03.2021



2.3 Calculation results, Exterior 1

2.3.3 3D luminance, View 1



Luminance in the scene

Minimum: : 0 cd/m²

Maximum: : 568 cd/m²